Conceptpower DPA™ USER MANUAL

Conceptpower DPA™ highlights at a glance

- DPA with Safe-Swap Modules (SSM)
  For premium power protection availability
- Low total Cost of Ownership (TCO)
  Cost saving during entire life-cycle
- Flexibility/Scalability
  Ease of power upgrade, pay as you grow
- Enhanced Serviceability
  Rapid fault recovery
- Link to Newavewatch™
  Instantaneous fault recognition

Safe-Swap Modular Power Protection
Power range: 8-200KW per rack

Specifications are subject to change without notice

Edition 31.03.2009

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1.1 MECHANICAL CHARACTERISTICS MD-FRAMES AND MODULES

CONCEPTPOWER DPA		CLASSIC DPA-25	TRIPLE DPA-75	UPGRADE DPA-125
MD - FRAMES				
Configuration accommodates:	Max.	1 module (10-25kVA) and 200 x 7/9Ah batteries	3 modules (10-25kVA) and 180 x 7/9Ah batteries	5 modules (10-25kVA) and no batteries
Max. Power connection	kVA	25	75	125
Dimensions (WxHxD)	mm	550x1650x780	550x1975x780	550x1975x780
Weight of Empty Frame w/o modules and w/o batteries	kg	180	218	171
Weight of Frame with modules and w/o batteries	kg	209 up to 215 (with 1 Module)	304 up to 323 (with 3 Modules)	314 up to 346 (with 5 Modules)
Colours		Front door silver :RAL 9007 + NEWAVE black (inlets) Side walls/top: Graffito grey (Pulverlacke No. 4222903402 serie 09RCCAT1)		

MD- DPA MODULES		DPA 10	DPA 15	DPA 20	DPA 25
Output Apparent Rated Power	KVA	10	15	20	25
Output Active Rated Power	KW	8	12	16	20
Output Power with Load PF=1	KVA / kW	8 / 8	12 / 12	16 /16	20 /20
Variable Number of 12V Battery Blocks	No.	30 – 50	30 – 50	30 – 50	40 - 50
Dimensions (WxHxD)	mm	483 x 225 x 700			
Weight UPS Module	kg	28.5	31	33	35
Colours		Front : Graffito grey (Pulverlacke No. 4222903402 serie 09RCCAT1)			

1.2 MECHANICAL CHARACTERISTICS MX-FRAMES AND MODULES

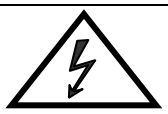
CONCEPTPOWER DPA		CLASSIC DPA-50	TRIPLE DPA-150	UPGRADE DPA-250
MX - FRAMES				
Configuration accommodates:	Max.	1 module (30-45kVA) and 280 x 7/9Ah batteries	3 modules (30-45kVA) and 240x 7/9Ah batteries	5 modules (30-45kVA) and no batteries
Max. Power connection	kVA	50	150	250
Dimensions (WxHxD)	mm	730x1650x800	730x1975x800	730x1975x800
Weight of Empty Frame w/o modules and w/o batteries	kg	262	239	205
Weight of Frame with modules and w/o batteries	kg	306 up to 318 (with 1 Module)	371 up to 407 (with 3 Modules)	425 up to 485 (with 5 Modules)
Colours		Front door silver :RAL 9007 + NEWAVE black (inlets) Side walls/top: Graffito grey (Pulverlacke No. 4222903402 serie 09RCCAT1)		

MX- DPA MODULES		DPA 30	DPA 40	DPA 50
Output Apparent Rated Power	KVA	30	40	45 [1)]
Output Active Rated Power	KW	24	32	40
Output Power with Load PF=1	KVA / KW	24 / 24	32 / 32	40 /40
Variable Number of 12V Battery Blocks	No.	40-50	40-50	40-50
Dimensions (WxHxD)	mm	663 x 225 x 720		
Weight UPS Module	kg	44	53	56
Colours		Front : Graffito grey (Pulverlacke No. 4222903402 serie 09RCCAT1)		
1) On Inverter mode 50 KVA/40kW on Bypass mode 45 KVA/40kW				

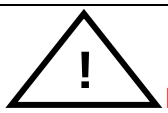
1.3 SAFETY INSTRUCTIONS

1.3.1 GENERAL SAFETY INTRODUCTION

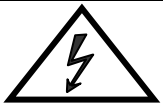
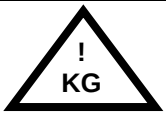
The UPS System operates with mains, battery or bypass power. It contains components that carry high currents and voltages. The properly installed UPS System is grounded to earth and IP 20 rated against electrical shock and foreign objects. Installation and service have to be done by the manufacturer's qualified technicians or their authorized service partners.

 **WARNING!**	**OPERATIONS INSIDE THE UPS MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM AN AGENT AUTHORIZED BY THE MANUFACTURER.**

This user manual contains guidelines to check delivery, installing and commissioning of the UPS and is intended for people who plan the installation, install, commission and use or service the UPS. The reader is expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols

 **NOTE!**	**CAREFULLY READ THE USER MANUAL BEFORE OPERATING OR WORKING ON THE UPS.**

1.3.2 DESCRIPITON OF SYMBOLS USED IN THIS MANUAL

 **WARNING!**	**THERE IS DANGER OF AN ELECTRICAL IMPACT**
NOTE!	**READ THE INFORMATION, IN ORDER TO AVOID EQUIPMENT DAMAGES**
 **HEAVY!**	**THE WEIGHT OF A UPS MODULE CAN REACH 60KG, THEREFORE IT CAN BE LIFTED ONLY BY 2 PERSON**

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1.3.3 Symbols, Controls, and Indicators

PROTECTIVE GROUNDING TERMINAL
A terminal which must be connected to earth ground prior to making any other connection to the equipment.

A terminal to which or from which a direct current or voltage may be applied or supplied.

This symbol indicates the word “phase”.

ON The principal power switch is in the “ON” position

OFF The principal power switch is in the “OFF” position.

C CAUTION: REFER TO MANUAL
St Refer to the Operator’s Manual for more information

DANGER: RISK OF ELECTRIC SHOCK
There is a risk of electric shock present, and you should observe associated warnings. The UPS contains high voltages.

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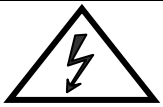
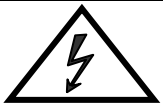
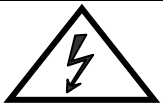
1.3.4 OPERATOR precautions

The only user operations permitted are:

- Use of the LCD control panel (LCD Display) and of the Maintenance Bypass
- Start up and shut down of the UPS of the user field (excluding the commissioning start up)
- Operation of additional connectivity modules:
- SNMP adapters and their software
- Modem/GSM or Modem/Ethernet adapters and their software
- Multidrop Kit for paralleling connectivity information between multi-frame configurations

The user must follow the precautions and only perform the described operations. Also in these measures the operator of the USP System must adhere to the instructions in this manual. Any deviations from the instructions could be dangerous to the user or cause accidental load loss.

NEWAVE SA DOES NOT TAKE ANY RESPONSIBILITY FOR DAMAGES CAUSED THROUGH WRONG MANIPULATIONS OF THE UPS SYSTEM.

 **WARNING!**	**IT IS PROHIBITED TO REMOVE ANY SCREWS FROM THE UPS SYSTEM OR FROM THE BATTERY CABINET. THERE IS A DANGER OF ELECTRICAL SHOCK.**
 **WARNING!**	**HIGH FAULT CURRENTS (LEAKAGE CURRENTS): BEFORE CONNECTING THE MAINS YOU MUST ENSURE THAT THERE IS A PROPER EARTH CONNECTION!**
 **WARNING!**	**THE USER MUST DISPLAY A WARNING SHIELD ON ALL PRIMARY UPS CIRCUIT BREAKERS. THE SERVICE PERSONNEL HAS TO BE INFORMED ABOUT DANGEROUS VOLTAGES. THE WARNING PANELS MUST CONTAIN THE FOLLOWING TEXT: " BEFORE STARTING WITH THE MAINTENANCE WORK ON THE CIRCUIT BREAKERS MAKE SURE THE UPS IS ISOLATED**

1.3.5 Environmental Considerations

The UPS must be installed according to the recommendations in this manual. To operate the UPS at peak efficiency, your installation site should meet the environmental parameters outlined in this manual. Excessive amount of dust in the operating environment of UPS may cause damage or lead to malfunction. The UPS should be always protected from the outside weather and sunshine. If you intend to operate the system at an altitude higher than 1000 meters, contact your local sales or service office for important information about high altitude operation. The operating environment must meet the weight, airflow, size and clearance requirements specified in the technical datasheet.

Under no circumstances the UPS should be installed in an airtight room, in the presence of flammable gases, or in an environment exceeding the specification.

The basic environmental requirements of the UPS system are:

- Ambient Temperature Range: 0 to +40˚C (32 – 104˚F)
- Recommended Operating Range: +20 to +25˚C (68 – 77˚F)
- Maximum Relative Humidity: 95% (non-condensing)

The UPS cabinet uses forced air cooling to regulate internal component temperature. Air inlets are in the bottom sides and front of the cabinet, and outlets in the rear of the cabinet. You must allow clearance in back of the cabinet for proper air circulation. Refer to Section 4, 4.2.2 POSITIONING for clearance requirements.

1.3.6 Declaration of Safety conformity and CE marking

The product has the CE marking in compliance with the following European directives:

- Low Voltage Directive: 2006/95/EC
- EMC Directive: 2004/108/EC

Declaration of conformity with UPS harmonized standards and directives EN 62040-1-1 (Safety) and EN 62040-2 (EMC) are available on the web site http://www.newaveups.com

Safety Standard:	IEC/EN 62040-1-1, IEC/EN 60950-1
Electromagnetic Compatibility Standard (EMC)	IEC/EN 61000-6-4 (product standard IEC/EN 62040-2 limit A (C2 UPS)) IEC/EN 61000-6-2 (product standard IEC/EN 62040-2 Criterion A (C2 UPS)) IEC/EN 61000-4-2, IEC/EN 61000-4-3, IEC/EN 61000-4-4, IEC/EN 61000-4-5, IEC/EN 61000-4-6
Performance Standard:	IEC/EN 62040-3

1.3.7 Inquiries

Address inquiries about the UPS and battery cabinet to the local office or agent authorized by the manufacturer. Please note the type code and the serial number of the equipment and contact your nearest agent authorized by the manufacturer (www.newaveups.com under Resellers).

The Code and the serial no. are shown on the nameplate see Section 3, 3.1.2 Nameplate

1.4 SYSTEM DESCRIPTION

The product described in this manual is a transformerless Uninterruptible Power System (UPS). It is a true online, continuous duty, double conversion, solid state, three-phase system, providing conditioned and uninterruptible AC power to protect the customer's load from all nine power failures.

1.4.1 GENERAL SYSTEM DESCRIPTION

The UPS's are used to protect sensitive equipment and prevent loss of valuable electronic information, minimise equipment downtime, and minimise the adverse effect on production equipment due to unexpected power problems.

The UPS system continually monitors incoming electrical power and removes the surges, spikes, sags, and other irregularities that are inherent in commercial utility power. Working with a building's electrical system, the UPS system supplies clean, consistent power that sensitive electronic equipment requires for reliable operation. During brownouts, blackouts, and other power interruptions, batteries provide emergency power to safeguard operation.

The UPS system is housed in single freestanding cabinets. The cabinets line up and match in style and colour, and have safety shields behind the doors for hazardous voltage protection.

1.4.1.1 Feature : Unique "Hot Swappable" Modules

The unique Hot Swappable feature of the Modules indicates the ability to insert and extract the electronic/power modules from a larger assembly while it is powered (hot). The hot swappable design allows live powered modules to be attached to and removed from a powered set without causing disturbance to the operation of the load and without need to go to bypass.

1.4.1.2 Feature : Advanced-Booster Technology

Traditional input THD filters are no longer needed with this UPS product. The build-in advanced booster technology of UPS modules provides perfect sinusoidal input power quality at 0.99 input power factor with harmonic content less than 3% THD(i). This leads to more reliable total system operation and savings in generator and transformer sizing as losses in the windings are minimised.

Due to the active front booster, regulating each individual phase, the UPS is comparable to a clean resistor load (unity) from the mains perspective. Thus, the high input power factor provides minimised cabling and fusing costs due to no reactive power consumption. The low harmonic currents are due to high input power factor and provide the benefits:

- No additional losses in wires and cables
- No extra heating of transformers and generators with shortened service life
- No over sizing of generators
- No false circuit breaker tripping and malfunction
- No erratic operation of computers, telecommunication, monitors, electronic test equipment etc.
- No Resonance with power factor correction capacitors

1.4.1.3 Feature : Flexible Battery Management (FBM)

The Flexible Battery Management (FBM) has been designed in all NEWAVE UPS products with the goal to avoid the deterioration of battery age. The FBM – Key Features protect the battery from environmental negative impacts (high temperature and false manipulations) and avoid deterioration of battery life by advanced management of battery charging and preventive failure diagnostics. The implemented features result in benefits not only for the end user, but also to the environment. The battery user will be required to replace his batteries less often. This translates into financial and environmental benefits. Last but not least a well protected and managed battery is a healthy battery and hence it enhance the overall availability of the UPS system.

The major benefits are:

- AC-Ripple free battery charging due to DC-DC charger separated from the rectifier and inverter
- Wide range of number of battery blocks (30-50 blocks of 12V)
- UPS'S wide input voltage window tolerance extends the battery life due to less discharge cycles
- Battery discharge protection caused by load jumps
- Proactive battery protection from false manipulations and inadequate charging voltages
- Proactive battery failure detection thanks to Advanced Battery Diagnosis (ABD) - Algorithm
- User selectable battery tests
- Optional temperature compensated charging to enhance battery life

Hence, the function of FBM system is to prolong the battery life considerably compared to traditional systems. In a traditional online UPS the inverter also causes ripple-current to be fed to batteries causing corrosion.

1.4.1.4 Feature : DPA Technology - Decentralized Parallel Architecture

The UPS product features DPA paralleling technology that provides N+X redundancy without introducing a single-point-of-failure. The products utilizing the DPA technology are completely autonomous be means of individual Power Units, Bypasses, CPU's, Control Panels and separate battery configuration for each single module.

The DPA technology makes it more reliable than traditional paralleling techniques. A parallel UPS system means the linking together of two or more UPS units in parallel so that in the unlikely event one fails the other can automatically take up the load. Traditionally a parallel redundancy configuration is achieved by having a random or fixed master-slave relationship among the UPS units. This master logic gives out individual commands to all the slaves units. Unfortunately this can lead to a single-point-of-failure for the whole system because if the master logic or communication to slaves fails, and causes the whole UPS system to be in trouble.

The DPA technology was developed as a Multi-Master logic concept with separated independent regulation and logic buses to allow parallel capacity system and to maintain the highest system availability. An industry leading paralleling technology in its own right, the DPA technology enables you to set up a parallel redundant system giving you 100% conditioned power at all times. Its unique decentralized design eliminates the system level single point of failure inherent in traditional parallel UPS, and exponentially increases the reliability of the overall system.

DPA technology allows up to ten UPS modules to cover the same load in parallel and redundant configuration. No vulnerable master logic is needed in this design. It provides automatic load sharing and module level redundancy with nothing other than the power connecting to the Conceptpower DPA^{TM} version of UPS modules.

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1.4.2 Conceptpower DPA™ basic system configuration

The UPS system is housed in single freestanding cabinets. The cabinets line up and match in style and colour, and have safety shields behind the doors for hazardous voltage protection.

The following basic UPS systems configuration are available:

Fig.1)

Fig. 2)

Fig. 3)

Fig. 4)

Fig. 5)

Fig. 6)

Description			UPS Packed					UPS Unpacked			
Figures	**UPS Frame Type**	**Module no.**	**Packed Weight with DPA 10 or 15 w/o Batt. in kg**	**Packed Weight with DPA 20 or 25 w/o Batt. in kg**		**Packed Dimension mm**		**Unpacked Weight with DPA 10 or 15 w/o Batt. in kg**	**Unpacked Weight with DPA 20 or 25 w/o Batt. in kg**		**Unpacked Dimension mm**
	Module		31	35		WxHxD		31	35		WxHxD
Fig. 1	**CLASSIC-DPA-25**	1	231	235		700x1800x890		211	215		550x1650x780
Fig. 2	**TRIPLE-DPA-75**	1	271	275		700x2120x890		249	253		550x1975x780
		2	302	310		700x2120x890		280	288		550x1975x780
		3	333	345		700x2120x890		311	323		550x1975x780
Fig. 3	**UPGRADE-DPA-125**	1	224	228		700x2120x890		202	206		550x1975x780
		2	255	263		700x2120x890		233	241		550x1975x780
		3	286	298		700x2120x890		264	276		550x1975x780
		4	317	333		700x2120x890		295	311		550x1975x780
		5	348	368		700x2120x890		326	346		550x1975x780
	UPS Frame Type	**Module no.**	**Packed Weight with DPA 30 w/o Batt. in kg**	**Packed Weight with DPA 40 w/o Batt. in kg**	**Packed Weight with DPA 50 w/o Batt. in kg**	**Packed Dimension mm**		**Unpacked Weight with DPA 30 w/o Batt. in kg**	**Unpacked Weight with DPA 40 w/o Batt. in kg**	**Unpacked Weight with DPA 50 w/o Batt. in kg**	**Unpacked Dimension mm**
	Module		44	53	56	WxHxD		44	53	56	WxHxD
Fig. 4	**CLASSIC-DPA-50**	1	329	338	341	890x1800x920		306	315	318	730x1650x800
Fig. 5	**TRIPLE-DPA-150**	1	308	317	320	890x2120x920		283	292	295	730x1975x800
		2	352	370	376	890x2120x920		327	345	351	730x1975x800
		3	396	423	432	890x2120x920		371	398	407	730x1975x800
Fig. 6	**UPGRADE-DPA-250**	1	274	283	286	890x2120x920		249	258	261	730x1975x800
		2	318	336	342	890x2120x920		293	311	317	730x1975x800
		3	362	389	398	890x2120x920		337	364	373	730x1975x800
		4	406	442	454	890x2120x920		381	417	429	730x1975x800
		5	450	495	510	890x2120x920		425	470	485	730x1975x800

1.4.3 Quality Standards and ups classification code

The Conceptpower DPA^{TM} will provide your critical equipment with a steady and reliable power supply for many years.

The unique and modular UPS Conceptpower DPA^{TM} belongs to the newest generation of midrange 3phase UPS-Systems. High reliability, low operating cost and excellent electrical performance are only some of the highlights of this innovative UPS solution.

The criteria and methods implemented at NEWAVE SA for the design and manufacture correspond to the most stringent quality standards.

NEWAVE is certified successfully in every areas according to the model of the International Standard ISO 9001/EN 29001. The Certification of UPS with the operating performance according to the Norm IEC 62 040-3 and VDE 0558 Part 530 is accomplished.

With it the NEWAVE UPS has the **Classification Code VFI-SS-111.**

Safety Standard:	IEC/EN 62040-1-1, IEC/EN 60950-1
Electromagnetic Compatibility Standard (EMC)	IEC/EN 61000-6-4 (product standard IEC/EN 62040-2 limit A (C2 UPS)) IEC/EN 61000-6-2 (product standard IEC/EN 62040-2 Criterion A (C2 UPS)) IEC/EN 61000-4-2, IEC/EN 61000-4-3, IEC/EN 61000-4-4, IEC/EN 61000-4-5, IEC/EN 61000-4-6
Performance Standard:	IEC/EN 62040-3

1.4.4 Single/Parallel-Modules operation

The Conceptpower DPA™ has unique paralleling features. We distinguish: Single or Parallel-Modules

A) Single-Module

If a configuration consists of one single Module it is defined as a Single-Module Configuration even being in different cabinets like CLASSIC DPA-25 or-50, TRIPLE DPA-75 or -150, UPGRADE DPA-125 or -250 with a single Module.

CLASSIC DPA-25 TRIPLE DPA-75 UPGRADE DPA-125

B) Parallel-Module:

+

+

A Parallel-Module is a Module that is operating in parallel with other equivalent Modules, but still within the same cabinet (e.g. TRIPLE DPA-75) using the DPA technology

TRIPLE DPA-75

1.4.5 Single/Multi-Cabinet Configurations

Single-Cabinet Configuration:

A single-cabinet configuration means, that there are no cabinets operating in a chain.

Multi-Cabinet Configurations:

It is possible to parallel Conceptpower DPA™ CLASSIC DPA-25 or-50,

TRIPLE DPA-75 or -150, UPGRADE DPA-125 or -250 Cabinets into a Multi-Cabinet Configuration (including total up to 10 Modules) in order to increase the number of paralleled Modules.

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1.4.6 Warranty

The UPS supplied is warranted against defects in design, materials for a period of twelve (12) months from its original date of commissioning or fifteen (15) months from the date of original delivery, whichever is the sooner.

Transportation cost of warranted material is not included in the warranty and has to be paid by the end-user.

Do not return anything without written authorization from NEWAVE or your closest service centre. NEWAVE or the closest service centre will give you further instructions how to proceed.

Any product must be returned with transportation charges prepaid and must be accompanied by a description of the failure. Products without description will not be handled.

The warranty is invalidated, if the UPS is put into operation without having been commissioned by a fully trained personal which is authorized by NEWAVE.

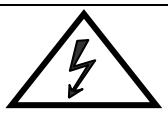
This warranty does not apply to any damage or losses caused by misuse, abuse, negligence, neglect, unauthorized repair or modification, incorrect installation, inappropriate environment, accident, act of God or inappropriate application.

If the UPS fails to conform to the above within the warranty period then NEWAVE SA or an authorized service centre will, at its sole option, repair or replace the UPS or parts of it. All repaired or replaced parts will remain the property of NEWAVE or of the authorized service centre.

NEWAVE is not liable for any costs resulting from a failure, if the installation, commissioning, repair, alternation, or ambient conditions of the equipment do not fulfil the requirements specified in the documentation delivered with the unit and other relevant documentation, such as loss of profits or revenue, loss of equipment, loss of data or software, cost of substitutes, claims by third parties or otherwise.

Under no circumstances shall NEWAVE, its suppliers or subcontractors be liable for special, indirect, incidental or consequential damages, losses or penalties. The technical data, information and specifications are valid at the time of printing. The UPS manufacturer reserves the right to modifications without prior notice.

As general policy, NEWAVE does not recommend the use of any of its products in life support applications where failure or malfunction of the NEWAVE product can be reasonably expected to cause failure of the life support device or to significantly affect us safety or effectiveness. NEWAVE does not recommend the use of any of its products in direct patient care. NEWAVE will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to NEWAVE that the risks of injury or damage have been minimized, the customer assumes all such risks and the liability of NEWAVE is adequately protected under the circumstances.



WARNING!

THE UPS MAY CONTAIN BATTERIES THAT MUST BE RE-CHARGED FOR A MINIMUM OF 24 HOURS EVERY 6 MONTHS TO PREVENT DEEP DISCHARGING. BATTERIES THAT HAVE BEEN, FOR WHATEVER REASON, DEEP DISCHARGED ARE NOT COVERED BY THE WARRANTY. *SEE SECTION3- POINT 3.4.1*

1.4.7 Extended Warranty

The local office or distributor may grant a Extended Warranty period different to the above twelve (12) months and refer to local terms of liability as defined in the supply agreement or maintenance contract.

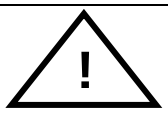
For more details please contact the nearest local office or agent authorized by the manufacturer. (www.newaveups.com Resellers).

1.5 DELVERY – TRANSPORT - STORAGE

1.5.1 Introduction

This chapter contains all the necessary information for the correct unpacking, positioning, cabling and installation of the UPS

The UPS and accessories are delivered on a specifically designed pallet that is easy to move with a forklift or a pallet jack. Keep the UPS always in upright position and do not drop the equipment. Do not either stack the pallets because of high-energy batteries involved and the heavy weight



NOTE!

IF THE UPS IS NOT IMMEDIATELY INSTALLED THE FOLLOWING GUIDELINES MUST BE FOLLOWED:

TRANSPORT:

UPS CABINETS AND/OR BATTERY CABINET CAN FALL OVER. USE THE SHIPPING BRACKETS ON THE REAR AND FRONT TO SECURE THE CABINETS. DO NOT TILT THEM MORE THAN 10° FROM VERTICAL, OTHERWISE CABINETS MAY TIP OVER.

POTENTIAL DANGERS:

- TILTING THE CABINET MIGHT DAMAGE THE SYSTEM AND THEREFORE SHOULD NO LONGER BE CONNECTED TO THE MAINS.
- WEIGHT OF THE UPS SYSTEM COULD CAUSE SERIOUS INJURIES TO PERSONS OR ANYTHING IN THE SURROUNDING AREA.

STORAGE:
- THE UPS SHOULD BE STORED IN THE ORIGINAL PACKING AND SHIPPING CARTON
- THE RECOMMENDED STORING TEMPERATURE FOR THE UPS SYSTEM AND BATTERIES IS BETWEEN +5 °C AND +40°C.
- THE UPS SYSTEM AND THE BATTERIE SETS MUST BE PROTECTED FROM HUMIDITY < 90% RF (NON- CONDENSING)

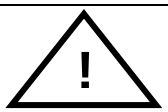
1.5.2 Receipt of the UPS and visual inspection

Upon receiving the UPS, carefully examine the packing container and the UPS for any sign of physical damage. The outside 'Tip&Tel' ("FRAGILE" and "ARROW") indicator should be intact if the equipment has been transported in the upright position. In case of rupture or suspect inform immediately:

- The carrier and
- NEWAVE SA.

Ensure that the received UPS corresponds to the material indicated in the delivery note.

The packing container of the **UPS** protects it from mechanical and environmental damage. To increase its protection the UPS is wrapped with a plastic sheet.



NOTE!

VISIBLE TRANSPORT DAMAGES MUST BE CLAIMED TO THE CARRIER IMMEDIATELY AFTER RECEIPT !!

OTHER CLAIM FOR SHIPPING DAMAGE MUST BE FILED IMMEDIATELY TOO AND THE CARRIER MUST BE INFORMED WITHIN 7 DAYS OF RECEIPT OF THE EQUIPMENT. THE PACKING MATERIALS SHOULD BE STORED FOR FURTHER INVESTIGATION.

1.5.3 Unpacking

Unpack the equipment by removing the packing and shipping materials. Make a visual inspection and check that 'Tip&Tel' indicator ("FRAGILE" and "ARROW") on the packing container is intact.

Perform the following steps to unpack the UPS equipment from the pallet and make sure that the floor surface is solid and suitable for the wheeling and heavy weight:

(1) Cut wrappers and remove packing container by pulling it upwards;

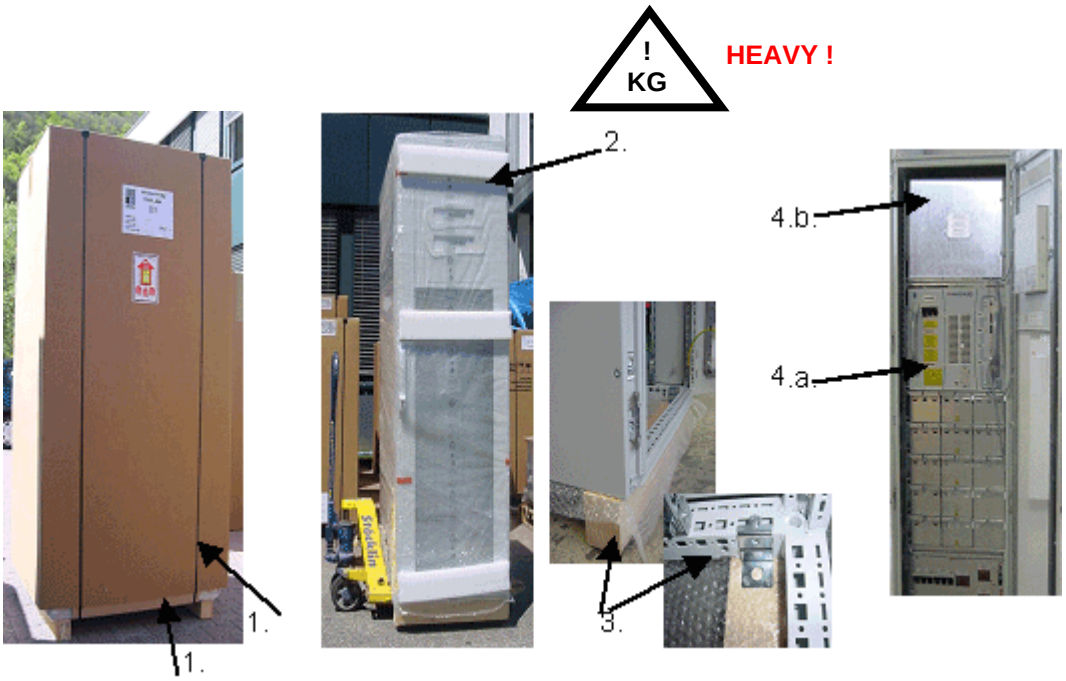
(2) Remove the plastic cover from the UPS;

(3) Remove pallet from the UPS;

- Retain the packaging materials for future shipment of the UPS;
- Examine the UPS for any sign of damage. Notify your carrier or supplier immediately if damage is apparent.

(4a) Open the UPS-door and make sure that all the UPS-Modules are appropriately fitted in their UPS-Compartment and if the UPS system is provided

(4b) Without a UPS-module make sure that the empty UPS-compartment is correctly covered with the UPS-compartment protection cover.



1.5.4 Nameplate

The technical specifications of the Equipment are provided on the nameplate, which is situated at the front of the UPS. Check if it corresponds to the purchased material mentioned in the delivery note.

Serial No.		UPS Module	Output Power	kVA	Output Power	kW
Production Date		CE	Input voltage	V+N	Output voltage	V+N
		Made in Switzerland	Input current	A	Output Freq.	Hz

1.5.5 Batteries And Storage

The standard batteries of the UPS are sealed, maintenance-free batteries, mounted usually in an external battery cabinet and will typically be connected when the UPS is commissioned.

The battery life depends very much on the ambient temperature. A temperature range between +18° and +23°C will achieve the optimum battery life.

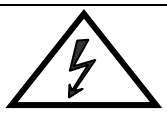
If the UPS is delivered without batteries, NEWAVE is not responsible for any damage or malfunctioning caused to the UPS by incorrect wiring.

HEAVY !

1.5.5.1 Storage of battery

The battery life depends very much on the ambient temperature. It is therefore important not to store the battery longer than 6 months at 20°C, 3 months at 30°C and 2 months at 35°C storage temperature without a battery recharge. For long-term storage make sure that the battery is fully recharged every 6 months. Before and after storing, charge the battery.

Always store the batteries in a dry, clean, cool environment in their original packaging. If the packing container is removed protect the batteries from dust and humidity.



WARNING!

SEALED BATTERIES MUST NEVER BE STORED IN A DISCHARGED OR PARTIALLY DISCHARGED STATE.

EXTREME TEMPERATURE, UNDER- AND OVERCHARGE AND OVERDISCHARGE WILL DESTROY BATTERIES!

1.5.5.2 Storage of UPS

If you plan to store the UPS prior to use, keep the UPS unpacked in a dry, clean and cool storage room with an ambient temperature between (+5 °C to +40°C) and humidity of less than 90%.

If the packing container is removed protect the UPS from dust.

! **NOTE!**	**THE UPS SYSTEM, THE BATTERY CABINET AND THE BATTERIES ARE HEAVY AND MAY TIP DURING TRANSPORTATION CAUSING SERIOUS INJURY IF UNPACKING INSTRUCTIONS ARE NOT CLOSELY FOLLOWED.**

1.6 SITE PLANNING AND POSITIONING

1.6.1 PLANNING BEFORE THE INSTALLATION

The equipment must be installed and transported in a upright position. The equipment requires space to bottom/front and back to enable cooling airflow. It is required to arrange ventilation of the UPS room.

All parts of the UPS for service and user access are accessible from the front and rear, making it a service-friendly and maintenance-friendly UPS. Reserve enough space from the front (min. 600 mm)

The UPS should be located where:

- Humidity (< 90 % non-condensing) and temperature (+15° and +25°C) are within prescribed limits
- Fire protection standards are respected
- Cabling can be performed easily
- Available front accessibility for service or periodic maintenance
- Requested air cooling flow should be granted
- The air conditioning system should have sufficient amount of air cooling needed to keep the max. room temperature rise at desired level:
- Dust or corrosive/explosive gases must be absent
- The place is vibration free
- Only front access is necessary for service and maintenance.
- If the UPS will be installed in bayed enclosures, partition walls have to be installed as well.

An ambient temperature of 15 to 25 Celsius degrees is recommended to achieve a long life of the UPS and batteries. The cooling *air entering the UPS must not exceed +40 °C.* Avoid high ambient temperature, moisture and humidity. The floor material should be non-flammable and strong enough to support the heavy load.

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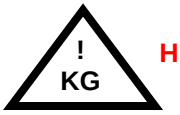
1.6.2 POSITIONING OF UPS AND BATTERY CABINET

1.6.2.1 Final Transport

Check before transporting the surface loading and use a adequate forklift to move the equipment to the final position.



HEAVY !

Fig. 3.6.3 Floor surface must support loading

Description			UPS Packed					UPS Unpacked			
Figures	UPS Frame Type	Module no.	Packed Weight with DPA 10 or 15 w/o Batt. in kg	Packed Weight with DPA 20 or 25 w/o Batt. in kg		Packed Dimension mm		Unpacked Weight with DPA 10 or 15 w/o Batt. in kg	Unpacked Weight with DPA 20 or 25 w/o Batt. in kg		Unpacked Dimension mm
	Module		31	35		WxHxD		31	35		WxHxD
Fig. 1	CLASSIC- DPA-25	1	231	235		700x1800x890		211	215		550x1650x780
Fig. 2	TRIPLE-DPA-75	1	271	275		700x2120x890		249	253		550x1975x780
		2	302	310		700x2120x890		280	288		550x1975x780
		3	333	345		700x2120x890		311	323		550x1975x780
Fig. 3	UPGRADE-DPA-125	1	224	228		700x2120x890		202	206		550x1975x780
		2	255	263		700x2120x890		233	241		550x1975x780
		3	286	298		700x2120x890		264	276		550x1975x780
		4	317	333		700x2120x890		295	311		550x1975x780
		5	348	368		700x2120x890		326	346		550x1975x780
	UPS Frame Type	Module no.	Packed Weight with DPA 30 w/o Batt. in kg	Packed Weight with DPA 40 w/o Batt. in kg	Packed Weight with DPA 50 w/o Batt. in kg	Packed Dimension mm		Unpacked Weight with DPA 30 w/o Batt. in kg	Unpacked Weight with DPA 40 w/o Batt. in kg	Unpacked Weight with DPA 50 w/o Batt. in kg	Unpacked Dimension mm
	Module		44	53	56	WxHxD		44	53	56	WxHxD
Fig. 4	CLASSIC- DPA-50	1	329	338	341	890x1800x920		306	315	318	730x1650x800
Fig. 5	TRIPLE-DPA-150	1	308	317	320	890x2120x920		283	292	295	730x1975x800
		2	352	370	376	890x2120x920		327	345	351	730x1975x800
		3	396	423	432	890x2120x920		371	398	407	730x1975x800
Fig. 6	UPGRADE-DPA-250	1	274	283	286	890x2120x920		249	258	261	730x1975x800
		2	318	336	342	890x2120x920		293	311	317	730x1975x800
		3	362	389	398	890x2120x920		337	364	373	730x1975x800
		4	406	442	454	890x2120x920		381	417	429	730x1975x800
		5	450	495	510	890x2120x920		425	470	485	730x1975x800

1.6.2.2 Positioning

UPS : A minimum 20 cm rear space from the UPS to an obstruction is recommended for proper cooling as the air enters at bottom/front and exits at unit rear (see Fig. 6.2.1 and 6.2.2)

External Battery : It's recommended to install external battery cabinet(s) next to the UPS unit. The external battery can be placed on either side of the UPS unit, but it is recommended to install on left hand side.

Check before the installation that the battery voltage values in the type plate of the UPS and external battery cabinets are the same.

WARNING!

THE UPS CONTAINS HIGH DC VOLTAGES. A QUALIFIED PERSON MUST DO THE CONNECTIONS BETWEEN THE UPS AND THE EXTERNAL BATTERY CABINET(S). THE BATTERY CABINET IS CONNECTED ELECTRICALLY IN PARALLEL WITH THE INTERNAL BATTERIES OF THE UPS.

WARNING!

IF AVAILABLE, THE INTERNAL BATTERY HAS TO BE DISCONNECTED FIRST BECAUSE THE EXTERNAL BATTERY TERMINALS ARE HAZARDOUS DUE TO THE PARALLEL BATTERY STRING.

Battery Racks : External battery racks shall be sized to take the voltage drop in the cable into account. To obtain support and help contact the local office or agent authorized by the manufacturer.

Clearances	X	Y
Minimum	200mm	900 mm

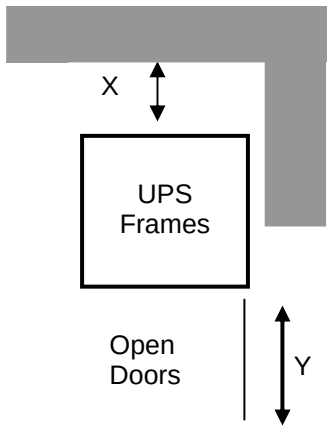


Figure 1: UPS space recommendation

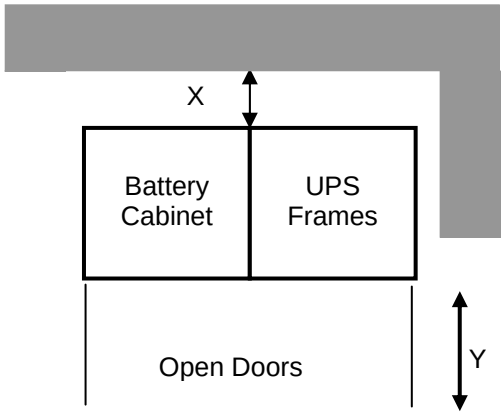
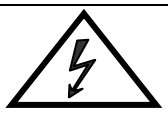


Figure 2 : : UPS + Battery space recommendation

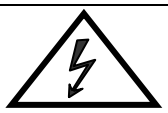
1.7 ELECTRICAL INSTALLATION

The customer has to supply the wiring to connect the UPS to the local power source see Section 2, chapter 1.1. The electrical installation procedure is described in the following text. The installation inspection and initial start up of the UPS and extra battery cabinet must be carried out by a qualified service personnel such as a licensed service engineer from the manufacturer or from an agent authorised by the manufacturer.



WARNING!

THE INSTRUCTION IN THIS USER MANUAL HAVE ALWAYS TO BE FOLLOWED IN ORDER TO AVOID INJURIES FROM ELECTRICAL IMPACTS.



WARNING!

ALL THE OPERATIONS IN THIS MANUAL MUST BE PERFORMED BY AUTHORISED ELECTRICIANS OR BY QUALIFIED INTERNAL PERSONNEL.

DO NOT OPERATE IN CASE OF PRESENCE OF WATER OR MOISTURE.

BY OPENING OR REMOVING THE UPS-COVERS YOU RUN RISK OF EXPOSURE TO DANGEROUS VOLTAGES

PHYSICAL INJURY OR DEATH MAY FOLLOW, OR DAMAGE MAY OCCUR TO THE UPS, OR THE LOAD EQUIPMENT IF THESE INSTRUCTIONS ARE IGNORED.

To ensure correct operation of the UPS and its ancillary equipment it is necessary to provide the mains cables with appropriate fuse protection. *See Section 2, chapter 1.2*

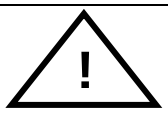
The UPS unit has the following power connections:

Rectifier (In) : **Three-phase** (1L1, 1L2, 1L3), Neutral (1N) and protective earth (PE) connection for the *rectifier input*

Bypass (In) : **Three-phase** (2L1, 2L2, 2L3), Neutral (2N) and protective earth (PE) connection for the *bypass if used as Dual Feed input*

Load (Out) : **Three-phase** (3L1, 3L2, 3L3), Neutral (3N) and protective earth (PE) connection for the *load output*

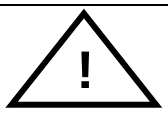
External Battery : **Plus (+), Common (N), Minus (-)** and protective earth (PE) connection for the *external batteries*



NOTE!

INPUT NEUTRAL IS REQUIRED TO OPERATE THE RECTIFIER.

1.7.1 PREPARATION FOR THE INPUT CABLING



NOTE!

Before proceeding read the chapter ELECTRICAL INSTALLATION (SECTION 1) and insure before starting connecting the cable to the UPS that:

- Mains voltage (INPUT VOLTS) and frequency (FREQUENCY) correspond to the values indicated on the Nameplate of the UPS.
- Earthing is performed in accordance with the prescribed IEC Standards or with local regulations;
- UPS is connected to the mains through a Low Voltage (LV)-Distribution Board with a separate mains line (protected with a circuit breaker or fuse) for the UPS.

Provide input fuses and cables according to *Section 2, chapter 1.2* or in accordance with the prescribed IEC Standards or with the local regulations.

The input of the UPS must be fitted with circuit breakers or other kind of protection. The circuit breakers will be connected between the mains supply and the UPS and will provide additional protection to the UPS in the event of overloads and short circuits.

1.7.1.1 Earthing and Connection of Mains Supply

To ensure protection of personnel during the installation of UPS make sure that the connections are performed under the following conditions:

- No mains voltage is present
- All Loads are shut down and disconnected
- UPS is shut down and voltage-free
- UPS-Module is fitted in its correct position
- Maintenance Bypass IA1 is open and in position OFF;
- Parallel Isolators *IA2-1, IA2-2, IA2-3, IA2-4, IA2-5* (depending of the UPS type) are in position OFF
- Remove Terminal cover of the UPS

1. Connect first the Earthing wire coming from the Low Voltage-Distribution Board to the terminal "PE".
2. Connect the input power cable coming from the Low Voltage-Distribution Board to the terminals of the UPS showed in *Section 2, chapter 1.2*
3. Keep the phase rotation in clock-wise sense.

NOTE!

INPUT NEUTRAL IS REQUIRED TO OPERATE THE RECTIFIER.

Under the connection terminal of the UPS there is a cable-fixing rail to ensure that the cables have been fastened properly.

NOTE: The **UPS** is provided with facilities for both single feed (one common input cable for rectifier and bypass) and dual feed (separate input cable for rectifier and bypass).

1.7.1.2 Single Input Feed

To achieve correct Input Cabling see Drawing ***Section 2, chapter 1.2***

For single input feed connect the mains input cable to UPS Terminal Block according to the following table:

MAINS INPUT CABLE	UPS TERMINAL
Phase L1	1L1
Phase L2	1L2
Phase L3	1L3
NEUTRAL	1N
EARTH	PE

For minimum recommended Input Cable Sections and Fuse Ratings ***Section 2, chapter 1.2***

Under the connection terminal of the UPS there is a cable-fixing rail to ensure that the cables have been fastened properly.

1.7.1.3 Dual Input Feed

To achieve correct input cabling see Terminal Block in ***Section 2, chapter 1.2***

NOTE: The UPS is supplied (as standard version) with facilities for a single cable feed (for rectifier and bypass).

If dual feed is required unscrew the terminal bridges between

UPS TERMINAL Rectifier		UPS TERMINAL Bypass	
1L1	●	●	2L1
1L2	●	●	2L2
1L3	●	●	2L3
1N	●	●	2N
PE	●	●	PE

For dual input feed connect the mains input cables to UPS Terminal according to following tables:

MAINS INPUT CABLE	UPS TERMINAL Rectifier
Phase L1	1L1
Phase L2	1L2
Phase L3	1L3
NEUTRAL	1N
EARTH	PE

BYPASS INPUT CABLE	UPS TERMINAL Bypass
Phase L1	2L1
Phase L2	2L2
Phase L3	2L3
NEUTRAL	2N
EARTH	PE

For minimum recommended Input Cable Sections and Fuse Ratings ***Section 2, chapter 1.2***

Under the connection terminal of the UPS there is a cable-fixing rail to ensure that the cables have been fastened properly.

1.7.1.4 Preparation for the Output Cabling

Before you start connecting the loads, ensure that the sum of the indicated UPS-module rated powers (OUTPUT POWER) on the nameplates (on the front side of the UPS-modules) is equal to or larger than the total load requirements.

The output of the UPS must be fitted with circuit breakers or other kind of protection. These circuit breakers will be connected between the loads and the UPS and will provide additional protection to the UPS in the event of overloads and short circuits.

These circuit breakers will enable the protection of each load separately.

The size of the circuit breakers depends on the load rating of the load sockets.

The circuit breakers must comply with the prescribed IEC Standards. It is recommended to provide a separate output distribution board for the load.

The following values should be indicated on the output distribution board:

Maximum total load rating;

Maximum load rating of the load sockets.

If a common distribution board is used (sockets for Mains and UPS voltage), ensure that on each socket there is an indication of the applied voltage (“Mains” or “UPS”).

Output power cable ratings should be in accordance with the recommended cable sections and fuses ratings or in accordance with the prescribed IEC Standards or with the local regulations.

Under the connection terminal of the UPS there is a cable-fixing rail to ensure that the cables have been fastened properly.

Ensure that the earthing is performed in accordance with the prescribed IEC Standards or with the local regulations.

1.7.1.5 Connection of the Load

To ensure protection of the personnel during the installation of the UPS make sure that the connections are performed under the following conditions:

No mains voltage is present;

All loads are shut down and disconnected;

PMC is shut down and voltage-free.

Before connecting the output power cables make sure that:

UPS-Module is fitted in its correct position;

Maintenance bypass is in position OFF;

Parallel Isolators IA2 is in position OFF

Remove the terminal cover of the UPS.

Connect the output power cable coming from the LV-Distribution Board to the terminals of the UPS as shown in drawing in Section 2 / Chapter 2 (Front view of the Conceptpower DPA TM ’s)

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1.7.2 Installation Checklist

- ☐ All packing materials and restraints have been removed from each cabinet.
- ☐ Each cabinet in the UPS system is placed in the installed location.
- ☐ All conduits and cables are properly routed to the UPS and auxiliary cabinets.
- ☐ All power cables are properly sized and terminated.
- ☐ A ground conductor is properly installed.
- ☐ If the cabinet does not use all module mounting locations, the provided protective covers are installed on the front and back of the cabinet.
- ☐ Battery cabinet installation instructions have been completed.
- ☐ Air conditioning equipment is installed and operating properly.
- ☐ The area around the installed UPS system is clean and dust-free. (It is recommended that the UPS be installed on a level floor suitable for computer or electronic equipment.
- ☐ Adequate workspace exists around the UPS and other cabinets.
- ☐ Adequate lighting is provided around all UPS equipment.
- ☐ Any optional accessories are mounted in their installed location and properly wired.
- ☐ Summary alarms and/or building alarms are wired appropriately. (OPTIONAL)
- ☐ Startup and operational checks performed by authorized service personnel.
- ☐ All network connections are completed.

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2.1 BLOCK DIAGRAM

2.1.1 WIRING AND BLOCK DIAGRAMS FOR ALL FRAMES AND MODULES

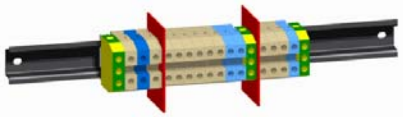
The customer has to supply the wiring to connect the UPS to the local power source. The installation inspection and initial start up of the UPS and extra battery cabinet must be carried out by a qualified service personnel such as a licensed service engineer from the manufacturer or from an agent authorized by the manufacturer.

2.1.2 RECOMMENDED CABLE SECTIONS & FUSE RATINGS

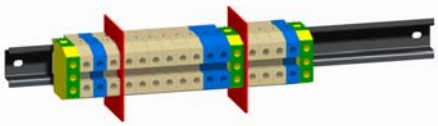
2.1.2.1 Terminal connections overview

FRAME TYPE Terminals (T) Connection Bar (B)	**Separate. Battery** (+ / N / -) +PE	**Common Battery** (+ / N / -) +PE	**Input Bypass** 3+N	**Input Rectifier** 3+N+PE	**Output load** 3+N+PE
CLASSIC DPA-25	3+1 x 16/25mm2 (T)	3+1 x 16/25mm2 (T)	4 x 10/16mm2 (T)	5 x 10/16mm2 (T)	5 x 10/16mm2 (T)
TRIPLE DPA-75	9+1 x 16/25mm2 (T)	3 x M6 (B) +PE 1 x 16mm2 (T)	4 x 35/50mm2 (T)	4 x 35/50mm2 (T) +PE 50 mm2 (T)	4 x 35/50mm2 (T) +PE 50 mm2 (T)
UPGRADE DPA-125	15+1 x 16/25mm2 (T)	3 x M10 (B) +PE 1 x 50mm2 (T)	4 x 70/95mm2 (T)	4 x 70/95mm2 (T) + PE 50mm2 (T)	4 x 70/95mm2 (T) + PE 50mm2 (T)
CLASSIC DPA-50	3+1 x 16/25mm2 (T)	3+1 x 16/25mm2 (T)	4 x 16/25mm2 (T)	5 x 16/25mm2 (T)	5 x 16/25mm2 (T)
TRIPLE DPA-150	9+1 x 16/25mm2 (T) +PE 1xM10 (B)	3 x M10 (B) +PE 1xM10 (B)	3 x M10(B) +PE 1xM10 (B)	4 x M10 (B) +PE 1xM10 (B)	4 x M10 (B) +PE 1xM10 (B)
UPGRADE DPA-250	15 x 16/25mm2 (T) +PE 1xM12 (B)	3 x M12 (B) +PE 1xM12 (B)	3 x M12 (B) +PE 1xM12 (B)	4 x M12 (B) +PE 1xM12 (B)	4 x M12 (B) +PE 1xM12 (B)

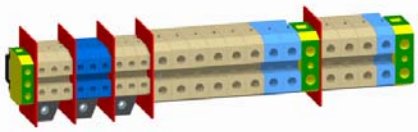
CLASSIC DPA-25



CLASSIC DPA-50

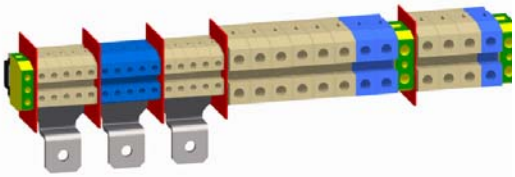


TRIPLE DPA-75

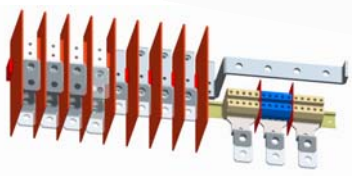


TRIPLE DPA-150

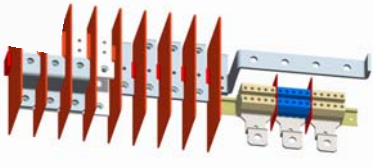
Upgrade DPA-125



UPGRADE DPA-250



Dual feed input

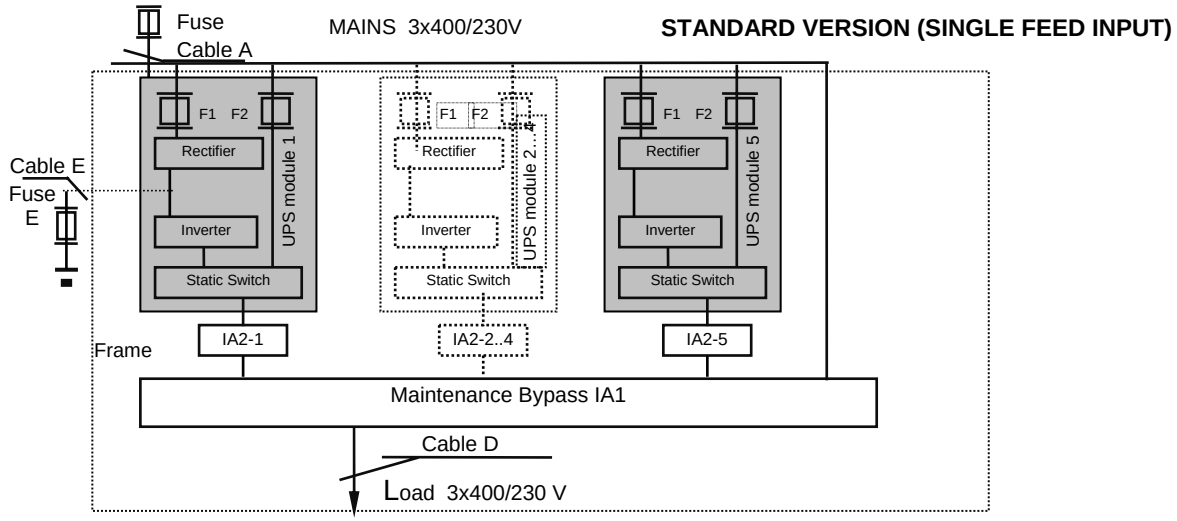


Single feed input

2.1.3 BLOCK DIAGRAM CONCEPTPOWER DPA

2.1.3.1 Single Feed input (Standard Version)

Cable Sections and Fuse Ratings recommended. Alternatively, local standards to be respected

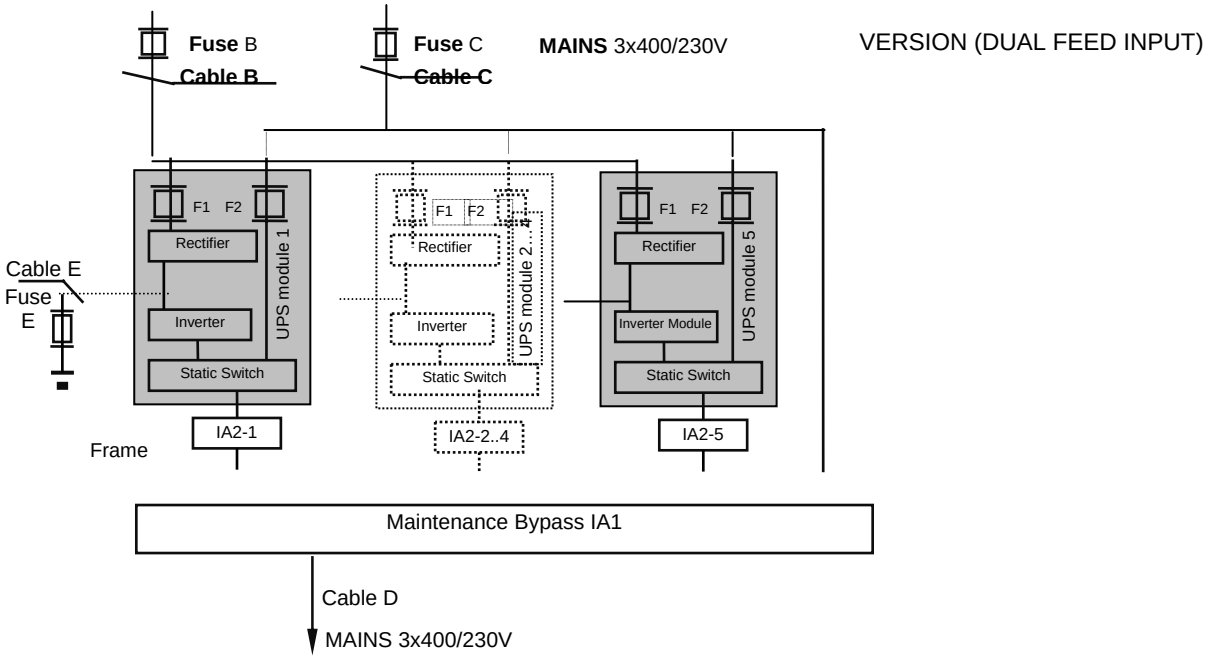


Frame type	Load kVA cosphi 0.8	Input 3x400V			Output 3x400V cosphi 0.8			Battery	
		Fuse A (Agl/CB)	Cable A (mm^2) (IEC 60950-1:2001)	Max. Input Current with battery charging (A)	Cable D (mm^2) (IEC 60950-1:2001)	I nom (A)	Fuse E + / N / - (Agl/CB)	Cable E (mm^2) for CBAT DPA 120 or 200 ONLY + / N / -	
								Com. Battery	Sep. Battery
MD Frames (Frames shall be cabled to there full rating capability)									
CLASSIC DPA-25	25	3x63A	5x10	34	5x10	36 A	3x63A*1	3x10	3x10
TRIPLE DPA-75	75	3x125A	5x50	101	5x50	108 A	3x160A*1	3x50	3x (3x10)
UPGRADE DPA-125	125	3x225A	5x95	169	5x95	181 A	3x260A*1	3x120	5x (3x10)
MX Frames (Frames shall be cabled to there full rating capability)									
CLASSIC DPA 50	50	3x100A	5x25	67	5x25	72 A	3x100A*1	3x25	3x25
TRIPLE DPA-150	150	3x250A	5x120 or 5x(2x50)	202	5x120 or 5x(2x50)	218 A	3x300A*1	3x150	3x (3x25)
UPGRADE DPA-250	250	3x400A	5x(2x95)	337	5x(2x95)	362 A	3x500A*1	3x(2x150)	5x (3x25)

*1 only valid for common battery use

2.1.3.2 Dual feed input (Optional Version)

Cable Sections and Fuse Ratings recommended. Alternatively, local standards to be respected



Frame type	Load kVA cosphi 0.8	Input 3x400V			Bypass 3x400V		Output 3x400V cosphi 0.8		Battery		
		Fuse B (Agl/CB)	Cable B (mm^2) (IEC 60950-1:2001)	Max. Input Current with battery charging (A)	Fuse C (Agl/CB)	Cable C (mm^2) (IEC 60950-1:2001)	Cable D (mm^2) (IEC 60950-1:2001)	I nom	Fuse E +/N/- (Agl/CB)	Cable E (mm^2) for CBAT DPA 120 or 200 ONLY + / N / -	
										Com. Battery	Sep. Battery
MD Frames (Frames shall be cabled to there full rating capability)											
CLASSIC DPA-25	25	3x63A	5x10	34	3x63A	4x10	5x10	36 A	3x63A*1	3x10	3x10
TRIPLE DPA-75	75	3x125A	5x50	101	3x125A	4x50	5x50	108 A	3x160A*1	3x50	3x (3x10)
UPGRADE DPA-125	125	3x225A	5x95	169	3x225A	4x95	5x95	181 A	3x260A*1	3x120	5x (3x10)
MX Frames (Frames shall be cabled to there full rating capability)											
CLASSIC DPA 50	50	3x100A	5x25	67	3x100A	4x25	5x25	72 A	3x100A*1	3x25	3x25
TRIPLE DPA-150	150	3x250A	5x120 or 5x(2x50)	202	3x250A	4x120 or 4x(2x50)	5x120 or 5x(2x50)	218 A	3x300A*1	3x150	3x (3x25)
UPGRADE DPA-250	250	3x400A	5x(2x95)	337	3x400A	4x(2x95)	5x(2x95)	362 A	3x500A*1	3x(2x150)	5x (3x25)

*1 only valid for common battery use

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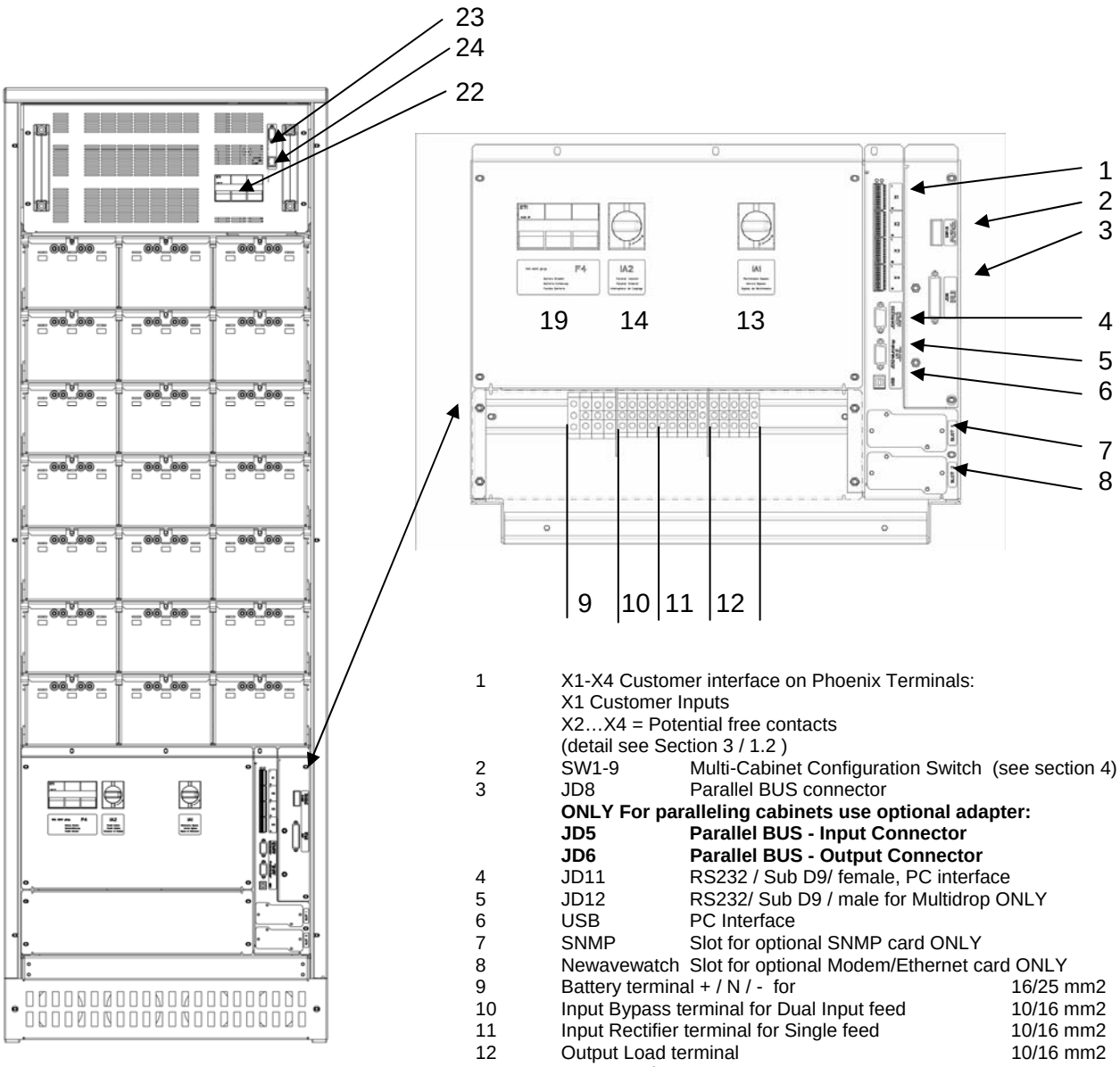
2.2 FRONT VIEW

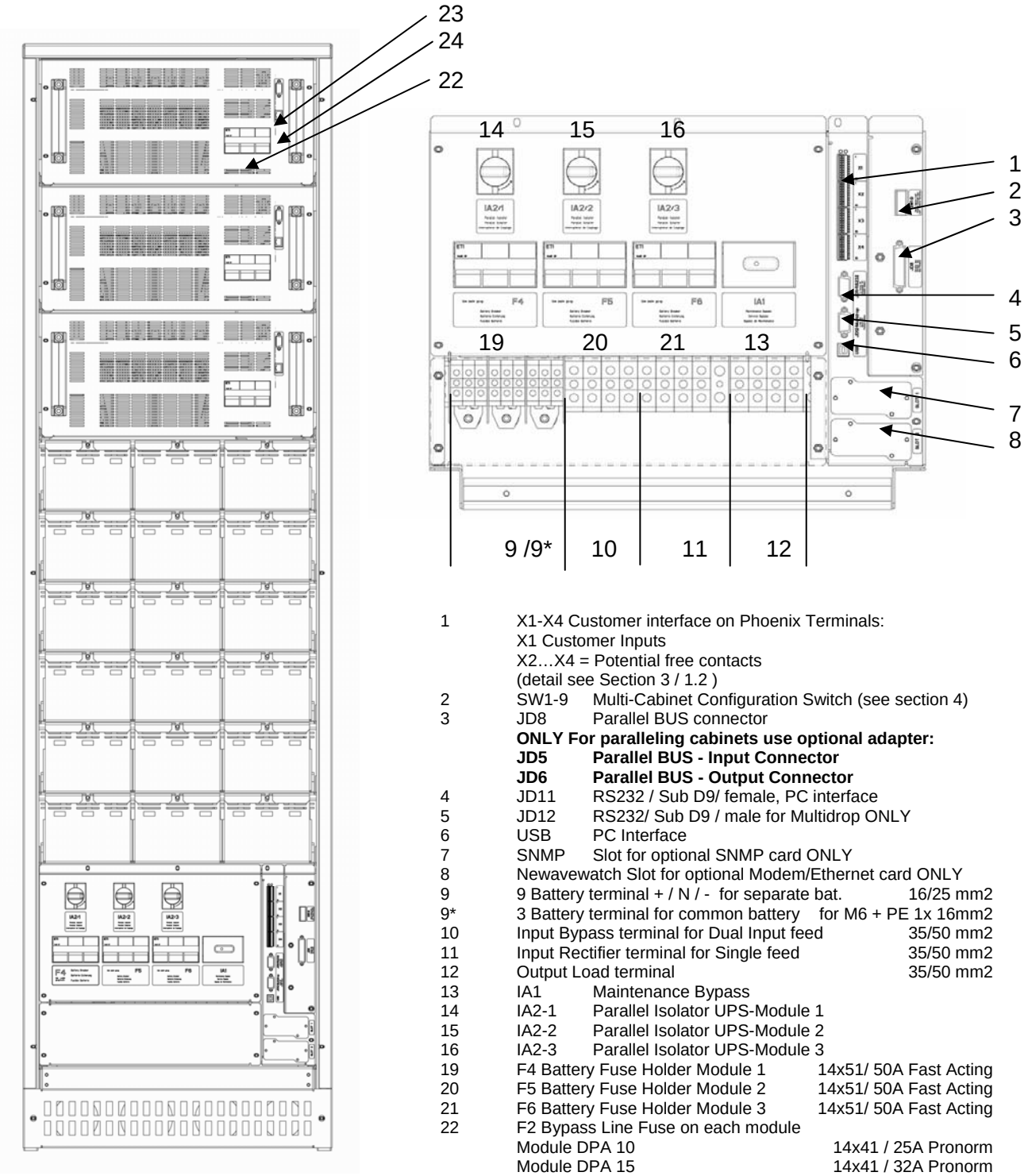
2.2.1 FRONT VIEW OF MD FRAMES

2.2.1.1 Front View CLASSIC DPA-25 and Connection Terminals



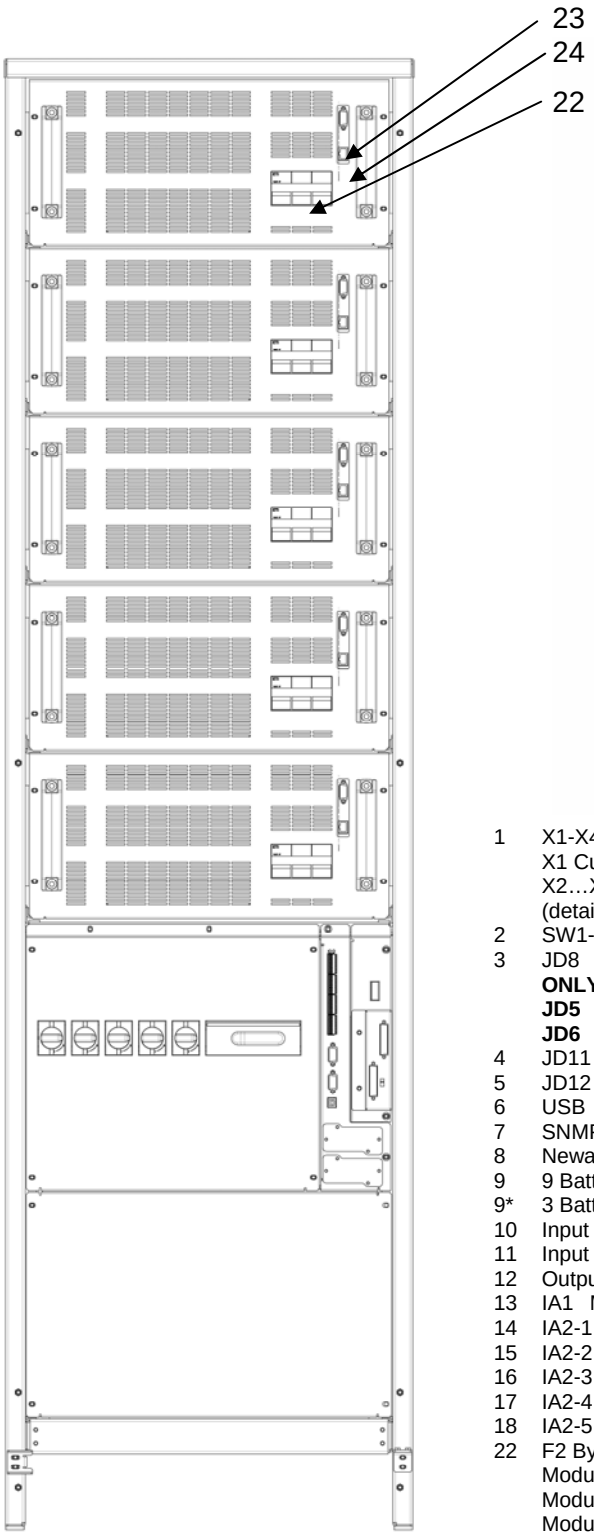
1	X1-X4 Customer interface on Phoenix Terminals: X1 Customer Inputs X2…X4 = Potential free contacts (detail see Section 3 / 1.2)		
2	SW1-9	Multi-Cabinet Configuration Switch (see section 4)	
3	JD8	Parallel BUS connector	
	ONLY For paralleling cabinets use optional adapter:		
	JD5	**Parallel BUS - Input Connector**	
	JD6	**Parallel BUS - Output Connector**	
4	JD11	RS232 / Sub D9/ female, PC interface	
5	JD12	RS232/ Sub D9 / male for Multidrop ONLY	
6	USB	PC Interface	
7	SNMP	Slot for optional SNMP card ONLY	
8	Newavewatch	Slot for optional Modem/Ethernet card ONLY	
9	Battery terminal + / N / - for		16/25 mm2
10	Input Bypass terminal for Dual Input feed		10/16 mm2
11	Input Rectifier terminal for Single feed		10/16 mm2
12	Output Load terminal		10/16 mm2
13	IA1 Maintenance Bypass		
14-(18)	IA2-1 Parallel Isolator UPS-Module 1		
19-(21)	F4 Battery Fuse Holder Module 1		14x51/ 50A Fast Acting
22	F2 Bypass Line Fuse on each module		
	Module DPA 10		14x41 / 25A Pronorm
	Module DPA 15		14x41 / 32A Pronorm
	Module DPA 20		14x41 / 32A Pronorm
	Module DPA 25		14x41 / 40A Pronorm
23	JD1	Smart Port- RS232 (Sub-D9P) (see section 3 / 1.1)	
24	JD7	Connector for Control Panel	

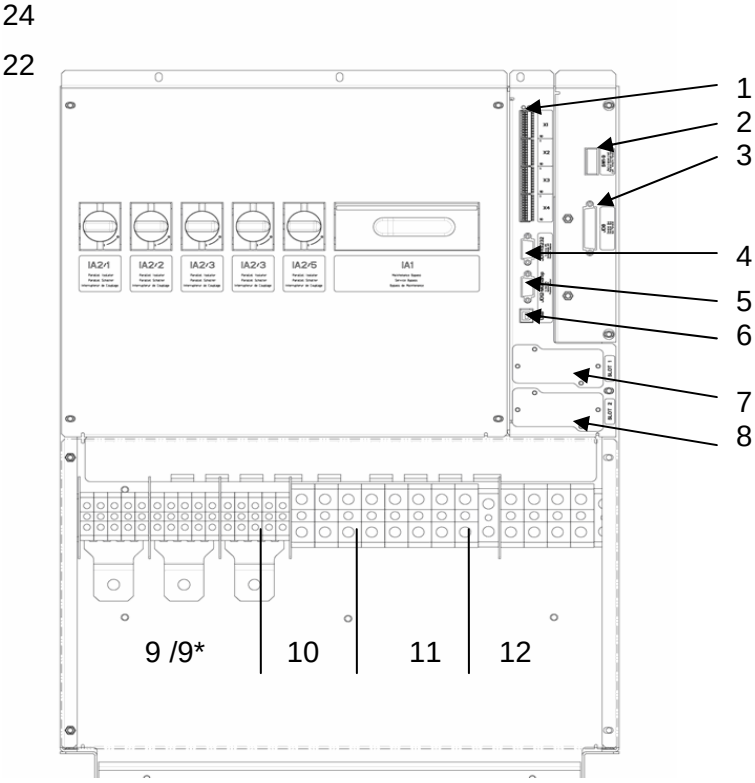
2.2.1.2 Front View TRIPLE DPA-75 and Connection Terminals



1	X1-X4 Customer interface on Phoenix Terminals: X1 Customer Inputs X2…X4 = Potential free contacts (detail see Section 3 / 1.2)		
2	SW1-9	Multi-Cabinet Configuration Switch (see section 4)	
3	JD8	Parallel BUS connector	
	ONLY For paralleling cabinets use optional adapter:		
	JD5	**Parallel BUS - Input Connector**	
	JD6	**Parallel BUS - Output Connector**	
4	JD11	RS232 / Sub D9/ female, PC interface	
5	JD12	RS232/ Sub D9 / male for Multidrop ONLY	
6	USB	PC Interface	
7	SNMP	Slot for optional SNMP card ONLY	
8	Newavewatch Slot for optional Modem/Ethernet card ONLY		
9	9 Battery terminal + / N / - for separate bat.		16/25 mm2
9*	3 Battery terminal for common battery		for M6 + PE 1x 16mm2
10	Input Bypass terminal for Dual Input feed		35/50 mm2
11	Input Rectifier terminal for Single feed		35/50 mm2
12	Output Load terminal		35/50 mm2
13	IA1	Maintenance Bypass	
14	IA2-1	Parallel Isolator UPS-Module 1	
15	IA2-2	Parallel Isolator UPS-Module 2	
16	IA2-3	Parallel Isolator UPS-Module 3	
19	F4 Battery Fuse Holder Module 1		14x51/ 50A Fast Acting
20	F5 Battery Fuse Holder Module 2		14x51/ 50A Fast Acting
21	F6 Battery Fuse Holder Module 3		14x51/ 50A Fast Acting
22	F2 Bypass Line Fuse on each module		
	Module DPA 10		14x41 / 25A Pronorm
	Module DPA 15		14x41 / 32A Pronorm
	Module DPA 20		14x41 / 32A Pronorm
	Module DPA 25		14x41 / 40A Pronorm
23	JD1	Smart Port- RS232 (Sub-D9P) (see section 3 / 1.1)	
24	JD7	Connector for Control Panel	

2.2.1.3 Front View UPGRADE DPA-125 and Connection Terminals

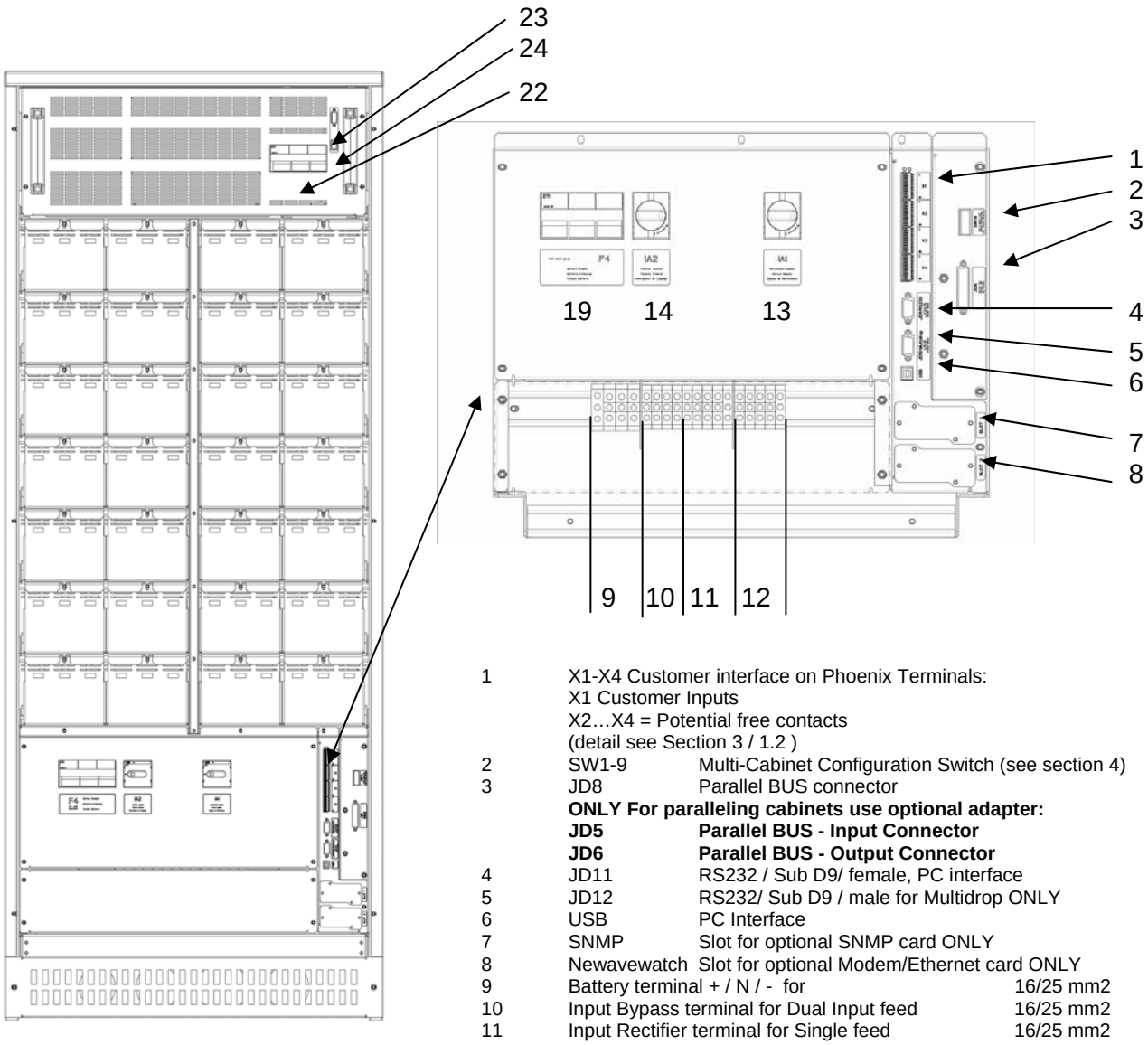




1	X1-X4 Customer interface on Phoenix Terminals: X1 Customer Inputs X2…X4 = Potential free contacts (detail see Section 3 / 1.2)		
2	SW1-9	Multi-Cabinet Configuration Switch (see section 4)	
3	JD8	Parallel BUS connector	
	ONLY For paralleling cabinets use optional adapter:		
	JD5	**Parallel BUS - Input Connector**	
	JD6	**Parallel BUS - Output Connector**	
4	JD11	RS232 / Sub D9/ female, PC interface	
5	JD12	RS232/ Sub D9 / male for Multidrop ONLY	
6	USB	PC Interface	
7	SNMP	Slot for optional SNMP card ONLY	
8	Newavewatch Slot for optional Modem/Ethernet card ONLY		
9	9 Battery terminal + / N / - for separate bat.		16/25 mm2
9*	3 Battery terminal for common battery	for M10 + PE	1x 50 mm2
10	Input Bypass terminal for Dual Input feed		70/95 mm2
11	Input Rectifier terminal for Single feed		70/95 mm2
12	Output Load terminal		70/95 mm2
13	IA1 Maintenance Bypass		
14	IA2-1	Parallel Isolator UPS-Module 1	
15	IA2-2	Parallel Isolator UPS-Module 2	
16	IA2-3	Parallel Isolator UPS-Module 3	
17	IA2-4	Parallel Isolator UPS-Module 4	
18	IA2-5	Parallel Isolator UPS-Module 5	
22	F2 Bypass Line Fuse on each module		
	Module DPA 10		14x41 / 25A Pronorm
	Module DPA 15		14x41 / 32A Pronorm
	Module DPA 20		14x41 / 32A Pronorm
	Module DPA 25		14x41 / 40A Pronorm
23	JD1 Smart Port- RS232 (Sub-D9P) (see section 3 / 1.1)		
24	JD7 Connector for Control Panel		

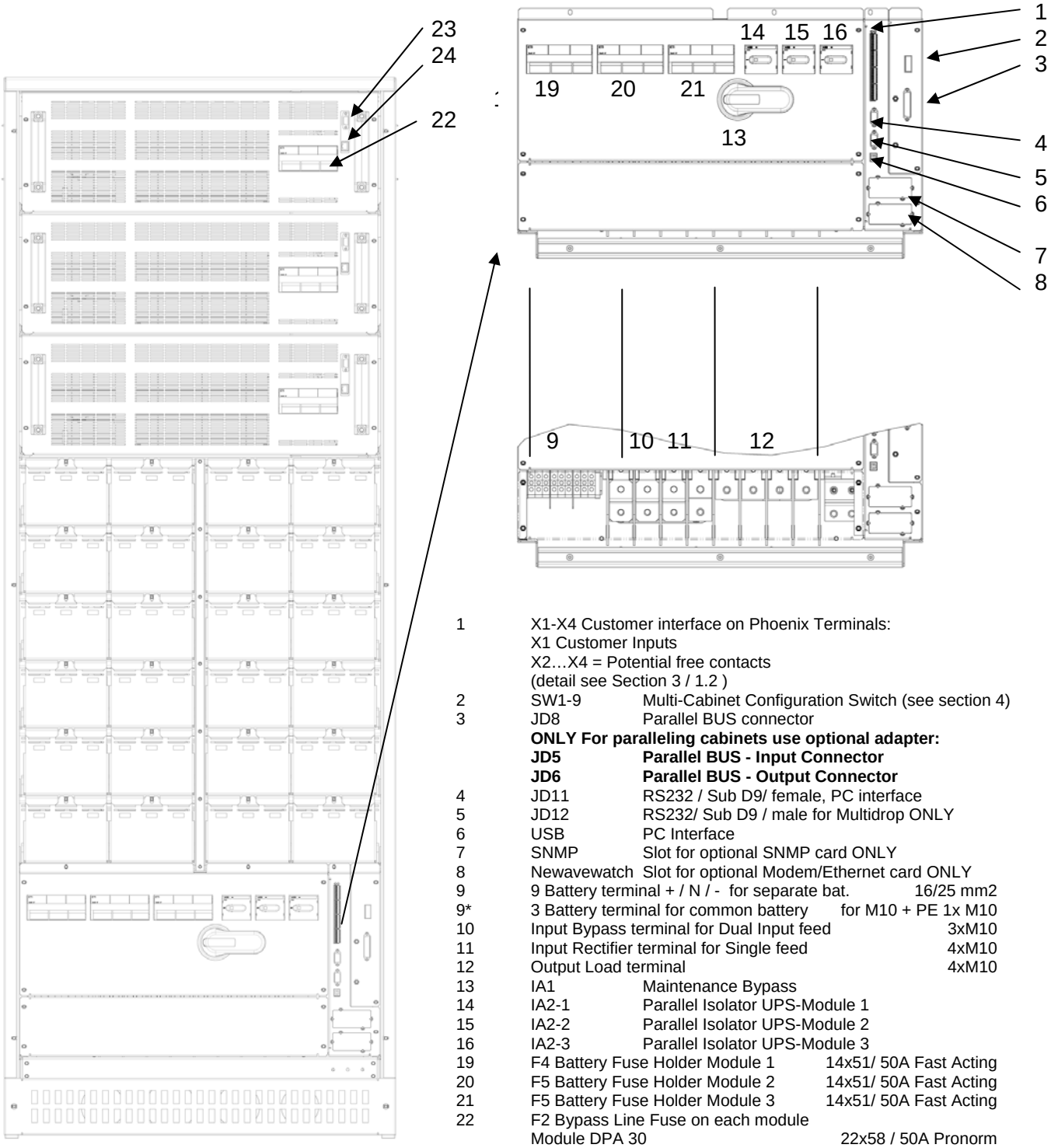
2.2.2 FRONT VIEW OF MX FRAMES

2.2.2.1 Front View CLASSIC DPA-50 and Connection Terminals



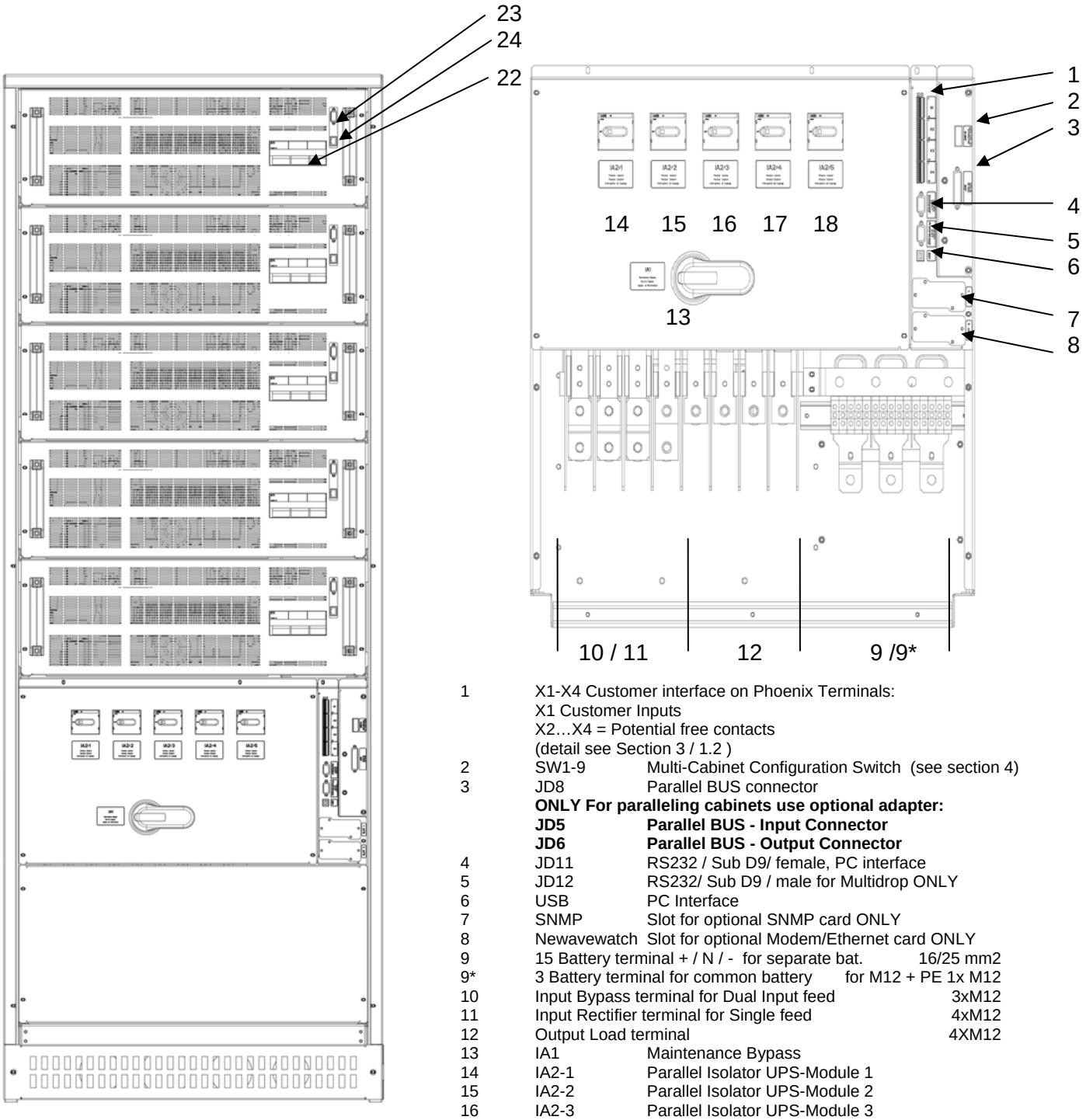
1	X1-X4 Customer interface on Phoenix Terminals: X1 Customer Inputs X2…X4 = Potential free contacts (detail see Section 3 / 1.2)		
2	SW1-9	Multi-Cabinet Configuration Switch (see section 4)	
3	JD8	Parallel BUS connector	
	ONLY For paralleling cabinets use optional adapter:		
	JD5	**Parallel BUS - Input Connector**	
	JD6	**Parallel BUS - Output Connector**	
4	JD11	RS232 / Sub D9/ female, PC interface	
5	JD12	RS232/ Sub D9 / male for Multidrop ONLY	
6	USB	PC Interface	
7	SNMP	Slot for optional SNMP card ONLY	
8	Newavewatch	Slot for optional Modem/Ethernet card ONLY	
9	Battery terminal + / N / - for		16/25 mm2
10	Input Bypass terminal for Dual Input feed		16/25 mm2
11	Input Rectifier terminal for Single feed		16/25 mm2
12	Output Load terminal		16/25 mm2
13	IA1	Maintenance Bypass	
14-(18)	IA2-1	Parallel Isolator UPS-Module 1	
19-(21)	F4 Battery Fuse Holder Module 1		14x51/ 50A Fast Acting
22	F2 Bypass Line Fuse on each module		
	Module DPA 30		22x58 / 50A Pronorm
	Module DPA 40		22x58 / 63A Pronorm
	Module DPA 50		22x58 / 63A Pronorm
23	JD1	Smart Port- RS232 (Sub-D9P) (see section 3 / 1.1)	
24	JD7	Connector for Control Panel	

2.2.2.2 Front View TRIPLE DPA-150 and Connection Terminals



1	X1-X4 Customer interface on Phoenix Terminals: X1 Customer Inputs X2…X4 = Potential free contacts (detail see Section 3 / 1.2)		
2	SW1-9	Multi-Cabinet Configuration Switch (see section 4)	
3	JD8	Parallel BUS connector	
	ONLY For paralleling cabinets use optional adapter:		
	JD5	**Parallel BUS - Input Connector**	
	JD6	**Parallel BUS - Output Connector**	
4	JD11	RS232 / Sub D9/ female, PC interface	
5	JD12	RS232/ Sub D9 / male for Multidrop ONLY	
6	USB	PC Interface	
7	SNMP	Slot for optional SNMP card ONLY	
8	Newavewatch	Slot for optional Modem/Ethernet card ONLY	
9	9 Battery terminal + / N / - for separate bat.		16/25 mm2
9*	3 Battery terminal for common battery		for M10 + PE 1x M10
10	Input Bypass terminal for Dual Input feed		3xM10
11	Input Rectifier terminal for Single feed		4xM10
12	Output Load terminal		4xM10
13	IA1	Maintenance Bypass	
14	IA2-1	Parallel Isolator UPS-Module 1	
15	IA2-2	Parallel Isolator UPS-Module 2	
16	IA2-3	Parallel Isolator UPS-Module 3	
19	F4 Battery Fuse Holder Module 1		14x51/ 50A Fast Acting
20	F5 Battery Fuse Holder Module 2		14x51/ 50A Fast Acting
21	F5 Battery Fuse Holder Module 3		14x51/ 50A Fast Acting
22	F2 Bypass Line Fuse on each module		
	Module DPA 30		22x58 / 50A Pronorm
	Module DPA 40		22x58 / 63A Pronorm
	Module DPA 50		22x58 / 63A Pronorm
23	JD1	Smart Port- RS232 (Sub-D9P) (see section 3 / 1.1)	
24	JD7	Connector for Control Panel	

2.2.2.3 Front View UPGRADE DPA-250 and Connection Terminals



1	X1-X4 Customer interface on Phoenix Terminals: X1 Customer Inputs X2…X4 = Potential free contacts (detail see Section 3 / 1.2)	
2	SW1-9	Multi-Cabinet Configuration Switch (see section 4)
3	JD8	Parallel BUS connector
	ONLY For paralleling cabinets use optional adapter:	
	JD5	**Parallel BUS - Input Connector**
	JD6	**Parallel BUS - Output Connector**
4	JD11	RS232 / Sub D9/ female, PC interface
5	JD12	RS232/ Sub D9 / male for Multidrop ONLY
6	USB	PC Interface
7	SNMP	Slot for optional SNMP card ONLY
8	Newavewatch	Slot for optional Modem/Ethernet card ONLY
9	15 Battery terminal + / N / - for separate bat.	16/25 mm2
9*	3 Battery terminal for common battery	for M12 + PE 1x M12
10	Input Bypass terminal for Dual Input feed	3xM12
11	Input Rectifier terminal for Single feed	4xM12
12	Output Load terminal	4XM12
13	IA1	Maintenance Bypass
14	IA2-1	Parallel Isolator UPS-Module 1
15	IA2-2	Parallel Isolator UPS-Module 2
16	IA2-3	Parallel Isolator UPS-Module 3
17	IA2-4	Parallel Isolator UPS-Module 4
18	IA2-5	Parallel Isolator UPS-Module 5
22	F2 Bypass Line Fuse on each module	
	Module DPA 30	22x58 / 50A Pronorm
	Module DPA 40	22x58 / 63A Pronorm
	Module DPA 50	22x58 / 63A Pronorm
23	JD1	Smart Port- RS232 (Sub-D9P) (see section 3 / 1.1)
24	JD7	Connector for Control Panel

2.3 BATTERY CONNECTIONS

2.3.1 INTERNAL BATTERY MODULES

2.3.1.1 Internal Battery Modules CLASSIC DPA-25

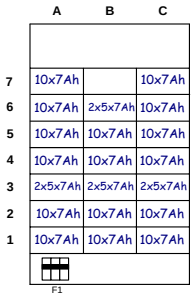
In **Conceptpower DPA™ CLASSIC DPA-25 FRAME** there is space for up to 200 x 9Ah internal batteries. In the drawing below different Battery and System configurations are shown.

NOTE: For UPS-Systems DPA 10kVA, DPA 15kVA and DPA 20kVA it is allowed to use 30-50 (only even numbers) of 12V-battery blocks.

For UPS-System DPA 25kVA use only 40-50 (only even numbers) of 12V-battery blocks.

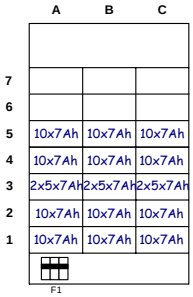
NOTE: Set-up the correct number of battery blocks on Control Panel (Menu: Service-Set-Up).

CONCEPTPOWER CLASSIC DPA-25



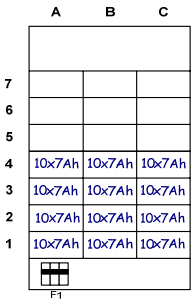
CLASSIC 25 frame

(4x50)x7Ah



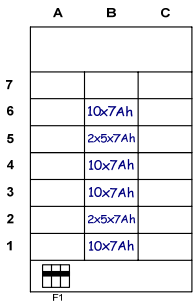
CLASSIC 25 frame

(3x50)x7Ah



CLASSIC 25 frame

(3x40)x7Ah



CLASSIC 25 frame

(2x30)x7Ah

Other combination possible : refer to Section 10

2.3.1.2 Internal Battery Modules TRIPLE DPA-75

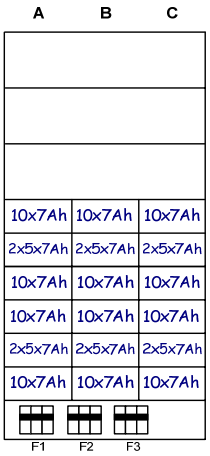
In **Conceptpower DPA™ TRIPLE DPA-75 FRAME** there is space for up to 180 x 9Ah internal batteries. In the drawing below different Battery and System configurations are shown. The batteries may be used as separate batches for each UPS-module or they can be used as common batteries for all three UPS-Modules.

NOTE: For UPS-Systems DPA 10kVA, DPA 15kVA and DPA 20kVA it is allowed to use 30-50 (only even numbers) of 12V-battery blocks.

For UPS-System DPA 25kVA use only 40-50 (only even numbers) of 12V-battery blocks.

NOTE: Set-up the correct number of battery blocks on Control Panel (Menu: Service-Set-Up).

CONCEPTPOWER TRIPLE DPA-75

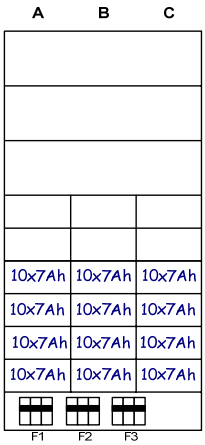


TRIPLE 75 frame

3x(2x30)x7Ah

TRIPLE 75 frame

(3x50)x7Ah



TRIPLE 75 frame

(3x40)x7Ah

Other combination possible : refer to Section 10

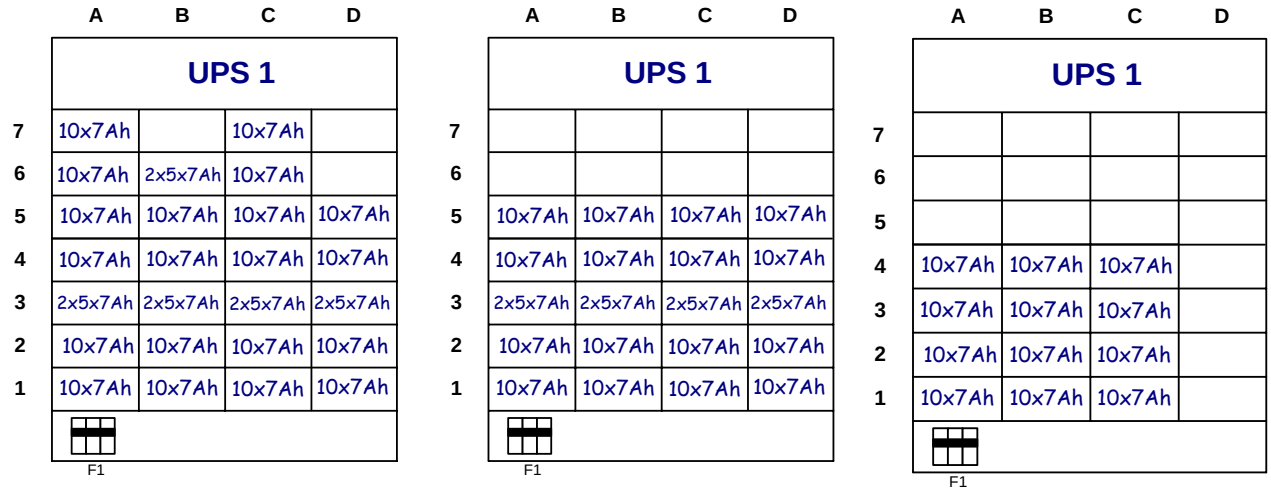
2.3.1.3 Internal Battery Modules CLASSIC DPA-50

In **Conceptpower DPA™ CLASSIC DPA-50 FRAME** there is space for up to 280 x 9Ah internal batteries. In the drawing below different Battery and System configurations are shown. The batteries may be used as separate batches for each UPS-Module or they can be used as common batteries for all tree UPS-Modules.

NOTE: For UPS-Systems DPA 30kVA and DPA 50kVA it is allowed to use 40-50 (only even numbers) of 12V-battery blocks.

NOTE: Set-up the correct number of battery blocks on Control Panel (Menu: Service-Set-Up).

CONCEPTPOWER CLASSIC DPA-50



DPA CLASSIC 50 frame

(5x50)x7Ah

DPA CLASSIC 50 frame

(4x50)x7Ah

DPA CLASSIC 50 frame

(3x40)x7Ah

Other combination possible : refer to Section 10

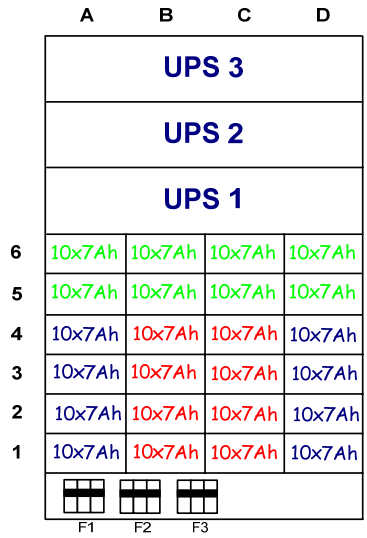
2.3.1.4 Internal Battery Modules TRIPLE DPA-150

In **Conceptpower DPA™ CLASSIC DPA-50 FRAME** there is space for up to 240 x 9Ah internal batteries. In the drawing below different Battery and System configurations are shown. The batteries may be used as separate batches for each UPS-Module or they can be used as common batteries for all tree UPS-Modules.

NOTE: For UPS-Systems DPA 30kVA and DPA 50kVA it is allowed to use 40-50 (only even numbers) of 12V-battery blocks.

NOTE: Set-up the correct number of battery blocks on Control Panel (Menu: Service-Set-Up).

CONCEPTPOWER TRIPLE DPA-150



3x(2x40)x7Ah

Other combination possible : refer to Section 10

2.3.2 EXTERNAL BATTERY CABINET AND BATERIY CONNECTION

WARNING!

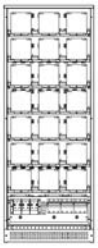
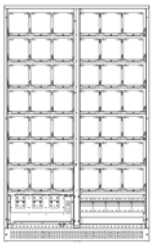
KEEP OUT OF BATTERY POLES WHICH CONTAIN DANGEROUS DC-VOLTAGES CAUSING FATAL ACCIDENTS.NOTE:
MANIPULATION ON THE BATTERY SYSTEM SHOULD ONLY BE DONE BY TRAINED SERVICE AND MAINTENANCE PERSONEL OF THE MANUFACTURER OR HIS AUTHORISED SERVICE PARTNERS. INAPPROPRIATE MANIPULATIONS OF THE BATTERIES CAN CAUSE LIGHTNING SPARKS. WHILE OPERATING ON BATTERY SYSTEMS IT IS MANDATORY TO WEAR GLASSES.

2.3.2.1 External Battery Configuration

In the UPS-cabinet of the **Conceptpower DPA ™ UPGRADE DPA 125 or UPGRADE DPA 250** there is no space provided for batteries.

There are 2 external matching battery cabinets available:

- CBAT DPA-120 for Separate or Common battery configurations of 24Ah or 28Ah blocks (max. 120 Blocks)
- CBAT DPA-200 for Separate or Common battery configurations for 24Ah or 28Ah blocks (max. 200 Blocks)

S-type = For Separate. Battery C-type = For Common. Battery		**CBAT-DPA-120** S-type or C-type	**CBAT-DPA-200** S-type or C-type
BATTERY FRAMES			
Configuration accommodates:	**Max.**	**120 Batt. block x 24Ah/28Ah on 8 shelf 3x5=15 blocks/shelf**	**200 Batt. blocks x 24Ah/28Ah on 7 shelf 6x5=30 blocks/shelf**
Battery fuses / Max. Batt. Strings : Terminals :	**S-type**	**3 / 3 (Terminal 9 x 16/25mm2)**	**5 / 5 (Terminal 15 x 16/25mm2)**
Battery fuses / Max. Batt. Strings Terminals :	**C-type**	**3 / 3 + Com. Connection Bar 3 x (2xM8) +PE 2xM8**	**5 / 5 + Com. Connection Bar 3 x (2xM10) +PE 2xM10**
Fuse Type (Very Fast acting)	**A**	**3x100 A**	**5x100A**
Dimensions (WxHxD)	**mm**	**730x1975x800**	**1200x1975x800**
Weight with trays and w/o batteries	**kg**	**290**	**410**

For detailed information and layout of the battery cabinets please refer to section 10 / Options

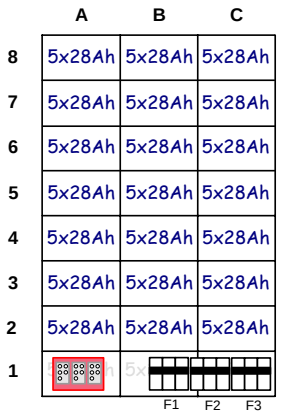
NOTE:
For UPS-Modules DPA 10kVA, 15kVA 20kVA it is allowed to use 30-50 (only even numbers) of 12V-battery blocks.

For UPS-Modules DPA 25kVA, 30kVA, 40kVA and 50kVA use only 40-50 (only even numbers) of 12V-battery blocks.

NOTE: Set-up the correct number of battery blocks on Control Panel (Menu: Service-Set-Up)

Frame: Upgrade DPA 125 or 250 with Modules DPA 25 or DPA 30 or DPA 50

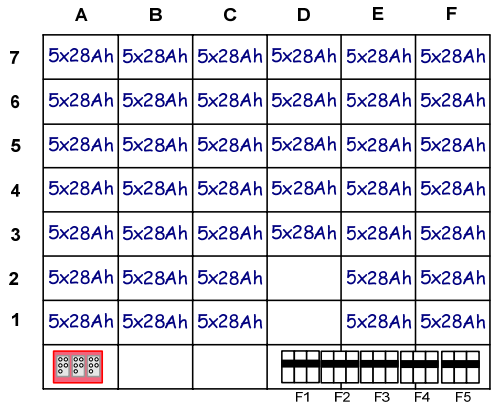
CBAT DPA-120



Battery Cabinet 120

(3x40)x28Ah

CBAT DPA-200



Battery Cabinet 200

(5x40)x28Ah

		CBAT DPA-120	CBAT DPA-200
Dimensions (WxHxD)	**mm**	**730x1975x800**	**1200x1975x800**
Weight with trays and w/o batteries	**kg**	**290**	**410**

For detailed information and layout of the battery cabinets please refer to section 10

Examples:
On drawing CBAT DPA-120 (3x40)x28Ah battery blocks are fitted. The lower batch of 40x24Ah belong to UPS 1, the middle batch of 40x 24Ah belong to UPS 2 and the top batch of 40x24Ah belong to UPS 3.

On drawing CBAT DPA-200 (5x40)x28Ah battery blocks are fitted in the battery cabinet and each UPS-Module is provided with 40x28Ah.

Depending on the request the batteries may be connected separately for each Module or it is possible to parallel them together into one common battery for five UPS-modules.

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2.3.2.2 Connection of External Battery Cabinet for Conceptpower DPA

It is normally recommended for redundant Multi-Module systems to provide each UPS-Module with its own separate battery. In this way the redundancy is extended also to the batteries. In the Figure 3.2.3 and Fig. 3.2.4 the drawing shows how to connect the batteries in the external battery cabinet and the Upgrade DPA frames.

! **NOTE!**	**ALL THE OPERATIONS IN THIS MANUAL MUST BE PERFORMED BY AUTHORISED ELECTRICIANS OR BY QUALIFIED INTERNAL PERSONNEL. DO NOT OPERATE IN CASE OF PRESENCE OF WATER OR MOISTURE. BY OPENING OR REMOVING THE UPS-COVERS YOU RUN RISK OF EXPOSURE TO DANGEROUS VOLTAGES!**

If the five battery batches are desired to be used as one common battery for all five UPS-Modules then Battery Links may be connected as shown below.

!

To ensure protection of the personnel during the installation of the UPS make sure that the connections are performed under the following conditions:

- No mains voltage is present in the UPS
- All the loads are disconnected
- The UPS and the external battery are voltage-free

To verify the complete shut down of the **Conceptpower DPA™** perform following steps:

1) Make sure that the fuses feeding the UPS in the input Distribution Board are all open and no power is fed to the UPS.
2) Make sure the "MAINTENANCE BYPASS"(IA1) is open (position "OFF")
3) Make sure the battery fuses in the external battery cabinet and on the UPS are open.
4) Connect Earth **(PE)** between the UPS and external battery cabinet.
5) Connect the corresponding **+ , N, -** terminals between UPS and external battery cabinet according to drawing

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2.3.2.3 Connection of External Separate Battery for Conceptpower DPA™

External Battery Cabinet DPA for separate Batteries per Module

Frame : UPGRADE DPA

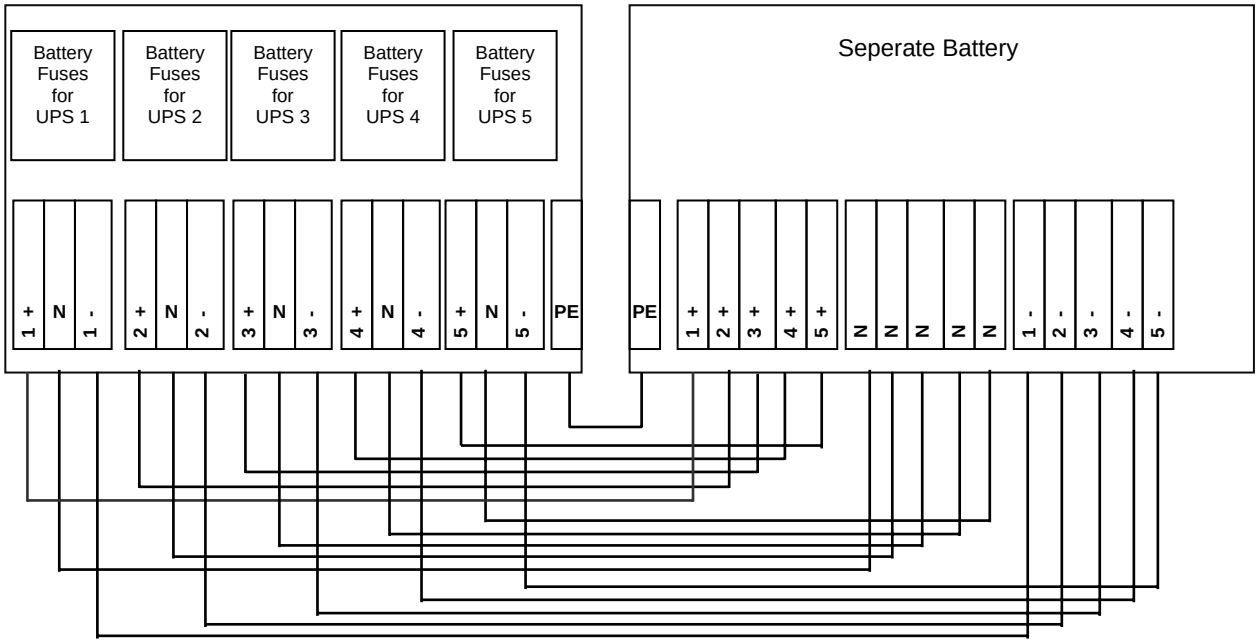
Battery Fuses for UPS 1
Battery Fuses for UPS 2
Battery Fuses for UPS 3
Battery Fuses for UPS 4
Battery Fuses for UPS 5
Seperate Battery
1 + N 1 -
2 + N 2 -
3 + N 3 -
4 + N 4 -
5 + N 5 -
PE
PE
1 + 2 + 3 + 4 + 5 +
N N N N N
1 - 2 - 3 - 4 - 5 -

Fig. 3.2.3 Connection of external separate batteries

2.3.2.4 Connection of External Common Battery for Conceptpower DPA™

External Battery Cabinet DPA for common Batteries

Frame : UPGRADE DPA

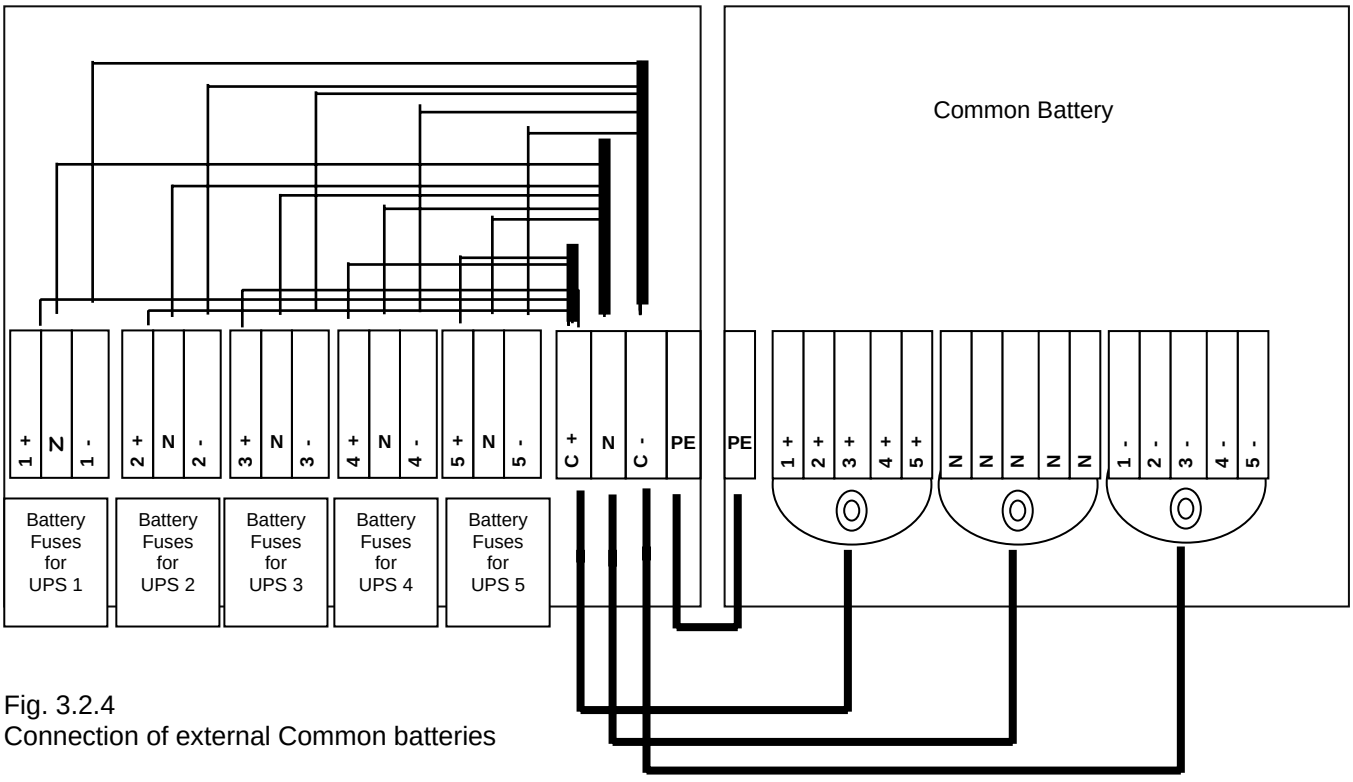
Common Battery
1 + N 1 -
2 + N 2 -
3 + N 3 -
4 + N 4 -
5 + N 5 -
C + N C - PE
PE
1 + 2 + 3 + 4 + 5 +
N N N N N
1 - 2 - 3 - 4 - 5 -
Battery Fuses for UPS 1
Battery Fuses for UPS 2
Battery Fuses for UPS 3
Battery Fuses for UPS 4
Battery Fuses for UPS 5

Fig. 3.2.4
Connection of external Common batteries

SECTION-3

3.1 INTERFACING 2
3.1.1 SMART PORT JD1 on each module (Serial RS 232 / Sub D9 / male) 2
3.1.2 Customer interface and DRY PORTs (volt-free contacts) 3
3.1.2.1 Input Interfaces Terminal block X1 3
3.1.2.2 Output Interfaces Terminal blocks X2, X3, X4 (DRY PORTs) 3
3.1.3 JD11 / RS232 Computer Interface 4
3.1.4 JD12 / RS232 Interface for Multidrop 4
3.1.5 USB/2 Computer Interface 4

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3.1 INTERFACING

Each UPS cabinet is provided with communication port on each single module and a communication card, which provides system information

On the Module :

- JD1 / RS232 Sub D9 / male: SMART PORT Interface (one per Module)

Communication card (next to the distribution) :

- Input Interfaces X1 (Phoenix terminals)
- Output Interfaces : X2, X3, X4 DRY PORTs ,volt-free contacts (Phoenix terminals)
- JD11 / RS232 Sub D9 / female : Interface (UPS system to computer)
- JD12 / RS232 Sub D9 / male Interface for Multidrop connection between several UPS cabinets
- USB Interface (UPS system to computer)

3.1.1 SMART PORT JD1 on each module (Serial RS 232 / Sub D9 / male)

The **SMART PORT JD1** located on the Modules itself is an intelligent RS 232 serial port that allows the UPS Module to be connected to a computer. The connector is a standard D-Type, 9-pin, male.

When installed the optional SMART PORT, the software WAVEMON allows the computer to monitor the mains voltage and the UPS status continuously.

In the event of any changes the computer terminal will display a message.
(For details see our Monitoring Package: ***WAVEMON***).

The Fig. 1.1 shows how to connect a PC to the UPS with different Sub-D connectors.

a) Interface Cable (UPS End) (9-Pin, D-Type Male) — Interface cable (Computer End) (9-Pin, D-Type Female)

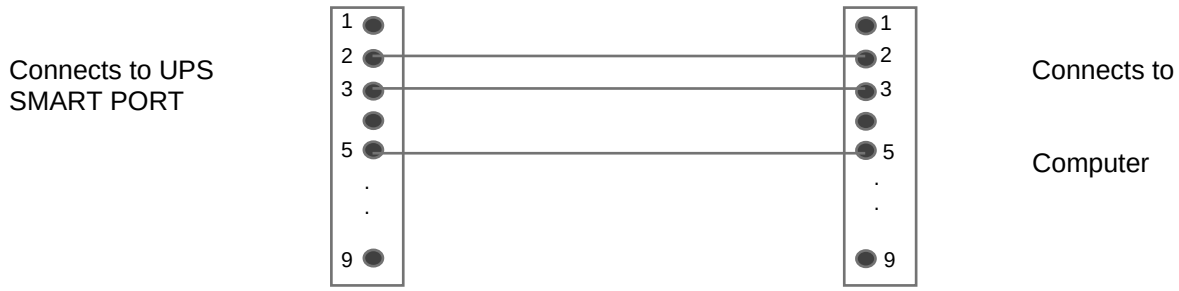

Figure 1.1 Connector Cable - PC Serial Port with 9-Pin Connection

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3.1.2 Customer interface and DRY PORTs (volt-free contacts)

All the Input and Output interfaces are connected to Phoenix terminals (cable 0.5 mm2)

3.1.2.1 Input Interfaces Terminal block X1

- Connection of Remote Shut down facilities, Generator Operation, Customers specials ***(see Section 9, chapter 1.2 OPTIONS)***

3.1.2.2 Output Interfaces Terminal blocks X2, X3, X4 (DRY PORTs)

- Provision of signals for the automatic and orderly shutdown of servers, AS400 or Automation building systems

All voltage free contacts are rated 60 VAC max. and 500 mA max.:

Block	Terminal	Contact	Signal	On Display	Function
X1	X1 / 1	IN	+ 3.3 Vdc		**Remote Shut down**
	X1 / 2	GND	GND		(Do not remove the factory mounted bridge until external Remote Shut down is connected)
	X1 / 3	IN	+ 3.3 Vdc		**Generator Operation**
	X1 / 4	GND	GND		(NC = Generator ON)
	X1 / 5	IN	+ 3.3 Vdc		**Customer IN 1**
	X1 / 6	GND	GND		(Function on request, to be defined)
	X1 / 7	IN	+ 3.3 Vdc		**Customer IN 2**
	X1 / 8	GND	GND		(Function on request, to be defined)
	X1 / 9	IN	+ 3.3 Vdc		**Temperature Battery**
	X1 / 10	GND	GND		(If connected , the battery charger current if depending of the battery temp.)
X2	X2 / 1	NO	ALARM	MAINS_OK	Mains Present
	X2 / 2	NC			**Mains Failure**
	X2 / 3	C			Common
	X2 / 4	NO	Message	LOAD_ON_INV	**Load on Inverter**
	X2 / 5	NC			(Load on Mains bypass)
	X2 / 6	C			Common
	X2 / 7	NO	ALARM	BATT_LOW	**Battery Low**
	X2 / 8	NC			Battery OK
	X2 / 9	C			Common
	X2 / 10	NO	Message	LOAD_ON_MAINS	**Load on bypass** (Mains)
X3	X3 / 1	NC			(Load on Inverter)
	X3 / 2	C			Common
	X3 / 3	NO	ALARM	COMMON_ALARM	**Common Alarm** (System)
	X3 / 4	NC			NO Alarm Condition
	X3 / 5	C			Common
	X3 / 6	NO	ALARM	MODUL_ALARM1	**Module 1 Alarm**
	X3 / 7	NC			NO Alarm Condition
	X3 / 8	C			Common
	X3 / 9	NO	ALARM	MODUL_ALARM2	**Module 2 Alarm**
	X3 / 10	NC			NO Alarm Condition
X4	X4 / 1	C			Common
	X4 / 2	NO	ALARM	MODUL_ALARM3	**Module 3 Alarm**
	X4 / 3	NC			NO Alarm Condition
	X4 / 4	C			Common
	X4 / 5	NO	ALARM	MODUL_ALARM4	**Module 4 Alarm**
	X4 / 6	NC			NO Alarm Condition
	X4 / 7	C			Common
	X4 / 8	NO	ALARM		**Module 5 Alarm**
	X4 / 9	NC			NO Alarm Condition
	X4 / 10	C			Common

Figure 1.2 Phoenix Terminals (X1…X4) Connection

On the Interface board are located two LED's:

- Green LED showing the status of the Interface:
  - Fast Blinking: 2 times/sec = Interface is Master (1st Cabinet of a parallel System)
  - Slow Blinking: 1 times/sec = Interface is Slave (2nd,.. 5th cabinet of a //- System)

  Red LED Board Alarm (indicates a possible replacement of the board)

On the Master board the following ports are active:

- The Input ports (X1)
- The Output port (X2, X3, X4)

On the Salve boards the following parts are active.

- The Output ports X3/6 … X3/10 and X4/1 …X4/10 (Means Alarm . Module 1 , 2, 3 ,4, 5)
  All other input or output ports on the Slave boards are not activated.

3.1.3 JD11 / RS232 Computer Interface

The **Computer Interface JD11** (4) located on the distribution part is an intelligent RS 232 serial port that allows the UPS system to be connected to a computer. The connector JD11 is a standard D-Type, 9-pin, female.

When installed the **Computer Interface**, the optional WAVEMON software allows the computer to monitor the mains voltage and the UPS system status continuously.

In the event of any changes the computer terminal will display a message.
(For details see our optional Monitoring Package: ***WAVEMON*).**

3.1.4 JD12 / RS232 Interface for Multidrop

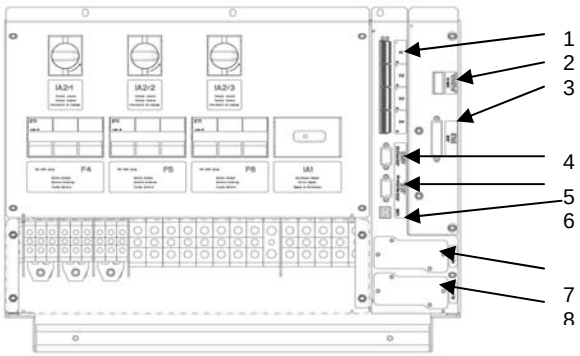
The **Computer Interface JD12** (5) located on the distribution part is an intelligent RS232 serial port that allows to get from several UPS cabinets which are connected in parallel the complete system information by using the Multidrop connection kit. (For details see user manual Multidrop kit). The connector JD12 is a standard D-Type, 9-pin, male.

3.1.5 USB/2 Computer Interface

The **Computer Interface USB** (6) located on the distribution part and is in parallel with the intelligent RS 232 serial port **JD11**.

When installed the **USB Computer Interface** trough, the optional WAVEMON software allows the computer to monitor the mains voltage and the UPS system status continuously.

In the event of any changes the computer terminal will display a message.
(For details see our optional Monitoring Package: ***WAVEMON*).**



Example : Distribution Interfaces

1	X1-X4 Customer interface on Phoenix Terminals: X1 Customer Inputs X2…X4 = Outputs Potential free contacts	
2	SW1-9	Multi-Cabinet Configuration Switch
3	JD8	Parallel BUS connector
	ONLY For paralleling cabinets use optional adapter:	
	JD5	**Parallel BUS - Input Connector**
	JD6	**Parallel BUS - Output Connector**
4	JD11	RS232 / Sub D9/ female, PC interface
5	JD12	RS232/ Sub D9 / male for Multidrop ONLY
6	USB	PC Interface
7	SNMP	Slot for optional SNMP card ONLY
8	Newavewatch	Slot for optional Modem/Ethernet card ONLY

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4.1 OPERATION

4.1.1 Commissioning

The Conceptpower DPA [TM] is a high quality electronic machine, that must be commissioned by a fully trained and authorized NEWAVE field service engineer before being put into use.

The commissioning of the UPS involves the connection of the UPS and battery, the checking of the electrical installation and operating environment of the UPS, the controlled start-up and testing of the UPS and customer training.

WARNING!

OPERATIONS INSIDE THE UPS MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

4.1.2 Control Panel

WARNING!

ONLY PERSONS WHICH HAVE BEEN TRAINED BY SERVICE TECHNICIANS OF THE MANUFACTURER OR HIS AUTHORIZED SERVICE PARTNERS ARE ALLOWED TO OPERATE ON THE CONTROL PANEL WITH CLOSED DOORS.
ALL OTHER INTERVENTIONS ON THE UPS SYSTEM HAVE TO BE DONE ONLY BY SERVICE TECHNICIANS OF THE MANUFACTURER.

The user-friendly control panel is composed of three parts:

- POWER MANAGEMENT LCD DISPLAY (PMD);
- LED INDICATORS;
- KEYS.

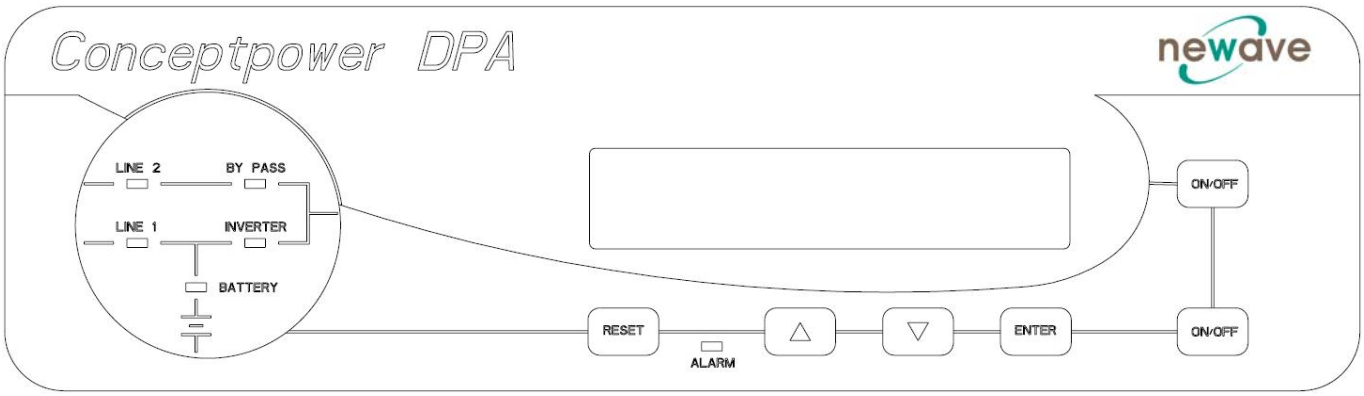

Figure 1.1 Control Panel

4.1.2.1 Power Management Display (PMD)

The 2 x 20 character LCD simplifies the communication with the UPS and provides the necessary monitoring information about the UPS. The menu driven LCD enables the access to the:

- EVENT REGISTER;
- Monitor the input and output U, I, f, P,
- Battery runtime;

- To perform commands like start-up and shut-down of UPS and
- Load transfer from INVERTER to BYPASS and vice-versa;
- DIAGNOSIS (SERVICE MODE);
- Adjustments and testing.

4.1.2.2 LED Indicators

The mimic diagram serves to indicate the general status of the UPS. The LED-indicators show the power flow status and in the event of mains failure or load transfer from inverter to bypass and vice-versa. The corresponding LED-indicators will change colours from green (normal) to red (warning).

The LED's LINE 1 (rectifier) and LINE 2 (bypass) indicate the availability of the mains power supply.

The LED's INVERTER and BYPASS if green indicate which of the two is supplying power to the critical load. When the battery is supplying the load due to mains failure the LED-indicator BATTERY is flashing.

The LED-indicator ALARM is a visual indication of any internal or external alarm condition. At the same time an audible alarm will be activated.

INDICATOR	INDICATOR STATUS	MEANING
ALARM	OFF RED	No alarm condition Alarm condition
LINE 1	GREEN RED	Mains rectifier available Mains rectifier not available
LINE 2	GREEN RED OFF	Mains bypass available Mains bypass not OK or not available UPS is turned off
BY-PASS	GREEN OFF	Load on bypass (Bypass-or Eco-Mode) Bypass not operating (switched-off)
INV	GREEN RED OFF	Load on inverter Inverter fault or load not transferable to inverter Inverter not operating (switched-off)
BATTERY	GREEN RED Flashing GREEN	Battery OK Battery fault or battery is discharged Battery in discharge or battery fuse open

4.1.2.3 Keys

The keys allow the user to operate the UPS to perform settings and adjustments, to start-up and shutdown the UPS, to monitor on the LCD display the voltages, currents, frequencies and other values.

KEYS	FUNCTION
ON/OFF ON/OFF	Serve to switch-on (press both keys simultaneously), or shutdown the UPS (press both keys simultaneously)
UP (↑)	Move upwards through the menu
DOWN (↓)	Move downwards through the menu.
RESET	Cancel the audible alarm. If the alarm condition was only transient the LED-indicator ALARM would also extinguish otherwise it will remain on (red).
ENTER	Confirms a chosen menu item.

4.1.2.4 ON/OFF Start-up and Shutdown Buttons

NOTE!

IN THE CASE THAT THE PARALLEL UPS SYSTEM HAS TO BE TURNED OFF, THEN BOTH ON/OFF BUTTONS ON ALL UPS MODULES HAVE TO BE PUSHED. IN THIS CASE THE POWER SUPPLY TO THE LOAD WILL BE INTERRUPTED

4.1.2.5 Definition of a Single/Parallel-Module System

To define a single or parallel UPS the “SET-UP SERVICE” menu, which is password protected, need to be activated using program line 4 “UPS MODEL”. See Service Manual Section E.

4.1.2.6 Definition of a Single/ Multi-Cabinet Chain (DIP Switch SW1-9)

By means of the DIP Switch SW1-9, which is located on the front of a Cabinet, it is possible to determine the “position” of the Cabinets in Multi-Cabinet Chain:

- **“First”** in the Multi-Cabinet Chain
- **“Middle”** in the Multi-Cabinet Chain (there may be more than one)
- **“Last”** in the Multi-Cabinet Chain.

NOTE: If a Cabinet is a **Single Cabinet** then it is seen as the **“First”** and **“Last”** in an imaginary Chain. So the positions of the DIP Switch SW1-9 must be set as shown below:

SW1-9	**Single Cabinet**	First Cabinet	Middle Cabinet	Last Cabinet
1	ON	ON	OFF	ON
2	ON	OFF	OFF	ON
3	ON	ON	OFF	OFF
4	ON	ON	OFF	ON
5	ON	ON	OFF	ON
6	ON	ON	OFF	ON
7	ON	ON	OFF	ON
8	ON	ON	OFF	ON
9	ON	ON	OFF	ON

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4.1.3 Description of the LCD

4.1.3.1 Status Screens

	DESCRIPTION	LCD-DISPLAY
1	Load is protected by UPS power. Load is supplied by inverter (Normal Operation) and the batteries are connected and o.k.	**LOAD S** **PROTECTED**
2	Load is not protected by UPS power. Load is supplied by mains power (load on bypass) or it is supplied by the inverter (Normal operation) and the batteries are not o.k.	**LOAD P01** **NOT PROTECTED**
3	Load not supplied. UPS is switched off To start the UPS press the two ON/OFF push buttons simultaneously	**LOAD OFF P09** **SUPPLY FAILURE**
4	The UPS is not supplying load anymore. The output switch is open	**LOAD DISCONNECTED P20** **PARALLEL SWITCH OPEN**

NOTE: On the right hand side of the LCD there is the indication of single /parallel UPS.
If the UPS is configured as single the indication will be “S”
If the UPS is configured as parallel the indication will be “P” followed by the UPS number
The max no. of module units are 20 per system.

EXEMPLES:

S stands for Single UPS. The system consists of ONLY one UPS (e.g. Classic cabinet)
P01 stands for Parallel UPS in a Multi-UPS system and 01 stands for the first Module (MASTER) in the Multi-UPS system.
P09 stands for Parallel UPS in a Multi-UPS system and 09 stands for the ninth Module (SLAVE) in the Multi- UPS system.
P20 stands for Parallel UPS in a Multi-UPS system and 20 stands for the twentieth Module (SLAVE) in the Multi- UPS system.

The configuration of the single / parallel UPS is achieved in the Menu “SET UP SERVICE”. See Service Manual section E

4.1.3.2 Main Menu Screen

	DESCRIPTION	LCD-DISPLAY
1	Logging Control. A log of the last 64 events is stored in the Power Management Display.	→ **EVENT LOG** MEASUREMENTS
2	In Menu Measurements: monitor voltages, power,frequencies, currents, autonomy etc.	→ **MEASUREMENTS** COMMANDS
3	The Command Menu enables to perform the commands “Load to inverter”, Load to bypass, battery test.	→ **COMMANDS** UPS DATA
4	The UPS Data are the UPS personalized information “serial number”	→ **UPS DATA** SET-UP USER
5	Various settings can be performed by the user: Date/Time, automatic battery test, etc.	→ **SET-UP USER** SET-UP SERVICE
6	Various adjustments can be performed by the service staff	→ **SET-UP SERVICE** **NO MORE MENU**

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4.1.3.3 Event Log Screen

DESCRIPTION		LCD-DISPLAY	
1	Logging Control; a log of the last 64 events is stored in the Power Management Display.	**01** 05-10-00 **LOAD TO INV.**	14-38-59
2	Every stored event is identified with a sequential number and time stamp.	**02** 05-10-00 **LOAD TO BYP.**	14-38-56
3	All events and alarms are indicated with their date and time of appearance.	**03** 05-10-00 **LOAD OFF**	14-37-14

4.1.3.4 Measurements Screen

DESCRIPTION		LCD-DISPLAY
1	Battery Runtime	**BATT. RUN TIME (MIN)** 00h 00m
2	UPS-Output Frequency	**OUTPUT FREQUENCY (HZ)** 50.00
3	Bypass Frequency.	**BYPASS FREQUENCY (HZ)** 50.00
4	Battery Voltage	**BATTERY VOLTAGE (V)** + 0.0 - 0.0
5	Battery Charger Current	**BATT. CHARGE CUR. (A)** + 0.0 - 0.0
6	Discharge Current.	**DISCHARGE CURRENT (A)** 00.00
7	Rectifier Voltage of all three phases	**RECTIFIER VOLTAGE (V)** 230 230 230
8	Bypass Voltage of all three phases	**BYPASS VOLTAGE (V)** 230 230 230
9	Output Voltage of all three phases	**OUTPUT VOLTAGE (V)** 230 230 230
10	Output Current of all three phases	**OUTPUT CURRENT (A)** 00.00 00.00 00.00
11	Active Output Power of all three phases	**ACTIVE POWER (KW)** 00.00 00.00 00.00
12	Reactive Output Power of all three phases	**REACTIVE POWER (kVAr)** 00.00 00.00 00.00
13	Apparent Output Power of all three phases	**APPARENT POWER (KVA)** 00.00 00.00 00.00
14	Output Power of all three phases	**OUTPUT POWER (%)** 00.00 00.00 00.00
15	Battery capacity	**BATT. CAPACITY (%)** 00.00

4.1.3.5 Commands Screen

DESCRIPTION		LCD-DISPLAY
1	Transfer Load to inverter	→ **LOAD TO INVERTER** LOAD TO BYPASS
2	Transfer Load to bypass.	→ **LOAD TO BYPASS** PERFORM BATT.TEST
3	Battery Test	→ **PERFORM BATT.TEST** **NO MORE COMMANDS**

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4.1.3.6 UPS Data

DESCRIPTION	LCD-DISPLAY
1 These general UPS Data are installed at the manufacturing plant	**UPS SERIAL NUMBER** **NW-nnnnn**
2 Manufacturing date	**DATE OF MANUFACTURE** **15-01-2003**
3 EPROM Version	**EPROM VERSION** **V-000**
4 Actual Date and Time	**DATE** **TIME** dd-mm-yyyy hh:mm:ss

4.1.3.7 Set-Up User

DESCRIPTION	LCD-DISPLAY
1 Set-up Language (not active yet)	→ **SET LANGUAGE** SET DATE AND TIME
	ENGLISH **FRANCAIS** **POLISH**
2 Set-up Date and Time	→ **SET-UP DATE/TIME** SET-UP BATT. TEST
	DD-MM-YY HH-MM-SS
3 Set-up battery test	→ **SET BATTERY TEST** SET GENERATOR OP.
	DAY OF MONTH **(1-31)**
	HOUR OF DAY **(1-24)**
	REPETITIVE (Y/N) YES/NO
4 Set-up operation with Gen-Set	→ **SET GENERATOR OP.** NO MORE SETTINGS
	BATT.CHARGE LOCK YES/NO
	BYPASS LOCK YES/NO

4.1.3.8 Set-Up Service

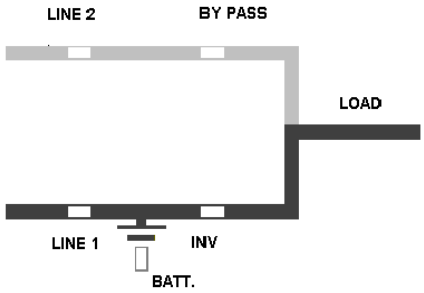
DESCRIPTION	LCD-DISPLAY
1 This Menu is reserved for authorized service engineers. It is not to be used by End-Users	→ **SET-UP SERVICE** PASSWORD
2 Type in password	→ **PASSWORD.**

Password is necessary to enter: Service Manual

4.1.4 Operating Modes

4.1.4.1 Mode "ON LINE" (INVERTER MODE)

The ON-LINE-Mode is the UPS-Operating Mode in which the load is supplied through the RECTIFIER and INVERTER.



LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	OFF
INVERTER	Green
BATTERY	Green

Using the control panel (see figure 1.1), the UPS can easily be transferred to the ON-LINE-Mode. The ON-LINE-Mode provides the highest degree of protection, especially in the event of a mains disturbance or failure.

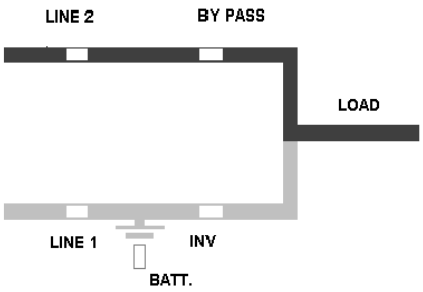
This operating mode is always recommended if the critical loads (computer systems) will not tolerate any interruption of the supply (not even the shortest).

In the unlikely event of an inverter fault or overload condition the UPS will transfer the load automatically and without interruption to the static bypass-mains supply (transfer time = 0).

4.1.4.2 Mode"OFF-LINE"(ECO- or BYPASS MODE)

In the "OFF-Line Mode", the load is supplied from the mains through the static bypass.

Using the control panel (see figure 1.1), the UPS may be easily transferred to "Bypass Mode".



LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	OFF
BATTERY	Green

When the UPS is operating in "Bypass Mode", the efficiency of the system is higher. In the event of a mains failure the load will automatically be transferred from mains to inverter within 5 msec (this is valid for single and parallel systems). The battery charger remains active in the "Bypass-Mode".

The "Bypass-Mode", is recommended only if the loads can tolerate interruptions of 3-5 ms (transfer time from Bypass Mode to ON-LINE Mode).

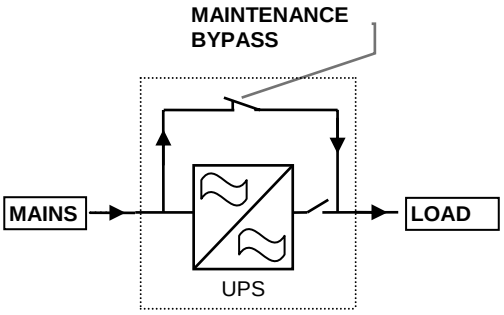
NOTE!

TO HAVE TO MOST ESSENTIAL SECURITY LEVEL, WE RECOMMEND TO RUN THE UPS ON NORMAL OPERATION MODE, MEANS UPS MODE.

4.1.4.3 "MAINTENANCE BYPASS" - Mode

The Maintenance Bypass Mode is performed by means of the IA1 BYPASS SWITCH on the front of the UPS:

POSITION OF SWITCH	EFFECT
ON	Bypass-Switch Closed (Load supplied directly from mains) LCD-indication: “MANUAL BYP IS CLOSED” LED Indicators will indicate as shown in table below.
OFF	Bypass-Switch Open – Normal operating condition (Load supplied by inverter) LCD-indication “MANUAL BYP IS OPEN” LED Indicators will indicate as shown in table below.



LED Indicator	ON	OFF
LINE 1	Green	Green
LINE 2	Green	Green
BYPASS	Green	OFF
INVERTER	RED	Green
BATTERY	Green	Green

Before transferring the load to Maintenance Bypass (IA1) always make sure all the UPS-modules are in the "Bypass-Mode” or “ECO-Mode”.

NOTE!

ON OPERATION MODE „MANUAL BYPASS“ THE LOAD IS NOT PROTECTED AGAINST ANY MAINS FAILURES OR MAINS DISTURBANCES.

4.1.4.4 Parallel Isolator (IA2)

Every UPS-unit (module) is provided with an output parallel isolator (IA2) which, when opened isolates the corresponding unit (module) from the PARALLEL BUS and from the LOAD. Once IA2 is open there is no power coming from its inverter.

In redundant parallel configurations it is used to isolate a unit from the parallel system without the need of transferring the load to bypass.

POSITION	EFFECT
ON	Normal Operation (Load supplied by UPS)
OFF	UPS-Module isolated from Parallel Bus for maintenance or module replacement (UPS-Module not supplying load)

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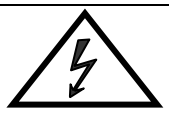
5.1 OPERATION - PROCEDURES

5.1.1 Start-Up Procedure



WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

Situation of UPS-System before switching it on:

1. Make sure the fuses for the supply of UPS-System in the Input Distribution Board on site are open.
2. Make sure all the input and output cabling has been performed correctly and check the input phase rotation.
3. Verify that all Parallel Isolator Switches IA2-1, IA2-2, IA2-3, IA2-4, IA2-5 (depending of the UPS frames) are open (Position OFF).
4. Verify that the Maintenance Switch IA1 is open and in Position OFF.
5. Make sure all the internal battery fuses in the UPS (if any) and the external battery cabinets are open.
6. Bypass fuses F2 on all UPS-modules are inserted.
7. Check the Position of the DIP Switches SW1-9. This is a **Single- Cabinet** Configuration, and the DIP Switches SW1-9 must be set according to positions shown in section 4 Table of Paragraph 1.2.6

Start up procedure of Conceptpower DPA ™:

1. Insert fuses for the supply of UPS-System in the Input Distribution
   - The LED-indicators LINE 1 and battery on UPS-Module is lit – green
   - On LCD-Display “LOAD OFF, SUPPLY FAILURE” will appear.
2. UPS-Module 1:
   Press both “ON/OFF” Main Buttons to switch on UPS.
   LCD panel must display: “LOAD DISCONNECTED PARALLEL SWITCH OPEN” and the LED-indicator will appear as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	OFF
BATTERY	Flashing Green

3. Check Command: LOAD TO INVERTER
   LED indicator will appear as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	OFF
INVERTER	Green
BATTERY	Flashing Green

4. Scroll through the menu measurement and check their correctness
5. Module 2: Repeat same procedure as for Module 1:Steps **2)-4).**
6. Module 3: Repeat same procedure as for Module 1:Steps **2)-4).**
7. Module 4: Repeat same procedure as for Module 1:Steps **2)-4).**
8. Module 5: Repeat same procedure as for Module 1:Steps **2)-4).**
9. Check battery polarity and voltage.
10. If the battery polarity and voltage is correct insert internal (if any) and external battery fuses (breakers).
11. Testing of Parallel Functions
    (The load fuses in output Distribution Board are still open i.e. the loads are disconnected!).
    All UPS-Modules are on INVETER MODE
12. Press simultaneously the two ON/OFF buttons on the UPS-control panel (PMD) on all control panels to turn the modules OFF. On the LCD's message "LOAD OFF, SUPPLY FAILURE" will appear
13. Close Parallel Isolator IA2-1 (position ON) of Module 1, on LCD: "PARALLEL SW CLOSED" will appear.
    Close Parallel Isolator IA2-2 (position ON) of Module 2, on LCD: "PARALLEL SW CLOSED" will appear.
    Close Parallel Isolator IA2-3 (position ON) of Module 3, On LCD: "PARALLEL SW CLOSED" will appear.
    Close Parallel Isolator IA2-4 (position ON) of Module 4, On LCD: "PARALLEL SW CLOSED" will appear
    Close Parallel Isolator IA2-5 (position ON) of Module 5, On LCD: "PARALLEL SW CLOSED" will appear
14. Press simultaneously the two ON/OFF buttons on the UPS-control panel (PMD) on all control panels to turn the modules ON. On output Terminal Block there is now UPS power and on all LCD's: "LOAD PROTECTED" will appear.
15. Load transfer to Maintenance Bypass
    Go to Menu COMMANDS and choose command "LOAD TO BYPASS" and transfer the load to mains on control panel of any one of the UPS-modules.
    Close Maintenance Bypass Switch IA1 (position ON)
    On LCD: "MANUAL BYP IS CLOSED" will appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	RED
BATTERY	Green

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16. Connect Load to the UPS Output
    Insert fuses in output Distribution Board
    Verify on control Panel that the load is on bypass
17. Open Maintenance Bypass Switch IA1
    On LCD: “MANUAL BYP IS OPEN” will appear followed by “LOAD NOT PROTECTED”
18. Check on LCD the Output Powers, Voltages Currents and Frequencies.
19. Load transfer to Inverter
    Go to Menu COMMANDS and choose command “LOAD TO INVERTER” and transfer the load to inverter on control panel of any one of the three UPS-modules.
    On all LCD’s: “LOAD PROTECTED” will appear followed by
20. Check the output Voltages and Currents once again.

THE LOAD IS NOW PROTECTED BY THE CONCEPTPOWER DPA ™

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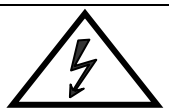
5.1.2 Shutdown Procedure



WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

The **CONCEPTPOWER DPA™** may be shutdown completely, if the load does not need input power for an extended period of time.
It may be switched to Maintenance Bypass Mode for service or maintenance purposes, or transferred to the OFF-LINE Mode (ECO-Mode), if the load does not need the highest degree of protection.
The load may be disconnected by means of the two ON/OFF (LOAD-OFF) buttons for security reasons.

Complete Shutdown procedure of CONCEPTPOWER DPA ™:

Only in case there is no need to supply the load, the UPS System can be completely shutdown. The following procedures can only be executed after the load has completely been de-energized.

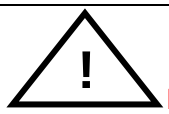
NOTE!

IN THE CASE THAT THE PARALLEL UPS SYSTEM HAS TO BE TURNED OFF, THEN BOTH ON/OFF BUTTONS ON ALL UPS MODULES HAVE TO BE PUSHED. IN THIS CASE THE POWER SUPPLY TO THE LOAD WILL BE INTERRUPTED.

1. Verify that the loads are shutdown and that there is no need for power supply to the load.
2. If the loads are all disconnected, press simultaneously both ON/OFF-Buttons on UPS-Control Panel on all three Control Panels.
   On the LCD: “LOAD OFF, SUPPLY FAILURE” will appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	OFF
BYPASS	OFF
INVERTER	OFF
BATTERY	Green

3. Open all Parallel Isolator Switches IA2-1, IA2-2, IA2-3, IA2-4, IA2-5 (depending of the UPS frames).
4. Open battery fuses/breakers on internal (if any) and external battery cabinets or racks.
5. Open the mains fuses/breaker in the building distribution panel.



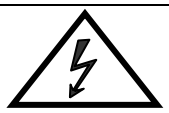
NOTE!

MAKE SURE THE INTERNAL DC-CAPACITORS (ELCO) HAVE BEEN DISCHARGED WAITING AT LEAST 10 MINUTES.

THE CONCEPTPOWER DPA ™ IS NOW VOLTAGE FREE.

5.1.3 Load Transfer: from Inverter operation to Maintenance Bypass

If it is necessary to perform service or maintenance on the UPS it is possible to transfer the UPS to MAINTENANCE BYPASS.



WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

Situation of UPS-System before starting the Transfer Procedure to Maintenance Bypass:

The load is protected by PMC running in normal operation. (The UPS-Module is operating on inverter).

1. Using LDC panel, select the COMMANDS menu and choose command “LOAD TO BYPASS” and transfer the load to mains on control panel of any one of the three UPS-modules
   On LCD panel “LOAD NOT PROTECTED” will appear.
2. Close Maintenance Bypass Switch IA1 (position ON).
   On LCD: “MANUAL BYP IS CLOSED” will appear and the mimic panel will show:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	RED
BATTERY	Green

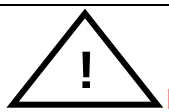
3. Press simultaneously the two ON/OFF buttons on the UPS-control panel (PMD) on all control panels.
   On the LCD’s message “LOAD OFF, SUPPLY FAILURE” will appear and the mimic panel will show:

LED Indicator	Colour
LINE 1	Green
LINE 2	OFF
BYPASS	OFF
INVERTER	OFF
BATTERY	Flashing Green

4. Open Parallel Isolators IA2-1, IA2-2, IA2-3, IA2-4, IA2-5 (depending of the UPS frames).
5. Open battery fuses/breakers on the internal (if any) and the external battery cabinets or racks.

NOTE!

THE UPS SYSTEM IS STILL POWERED (DANGEROUS VOLTAGE).

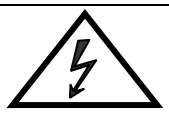


NOTE!

THE LOAD IS NOW SUPPLIED BY MAINS AND IS THEREFORE NOT PROTECTED THROUGH THE UPS.

5.1.4 Load Transfer: from Maintenance Bypass to Inverter operations

This procedure describes the sequence of operations to be done in order to restart the UPS and restore ON-LINE mode (Load on Inverter).



WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

Situation of UPS-System before starting the Transfer Procedure to ON-LINE mode:

The load is supplied directly by Input Mains power and the UPS is OFF.

1. Close battery fuses/breakers in the external battery cabinets or racks.
2. On the LCD's: "LOAD OFF, SUPPLY FAILURE" will appear and the mimic panel will show:

LED Indicator	Colour
LINE 1	Green
LINE 2	OFF
BYPASS	OFF
INVERTER	OFF
BATTERY	Flashing/Green

3. Close Parallel Isolators IA2-1, IA2-2, IA2-3, IA2-4, IA2-5 (depending of the UPS frames) and check message "PARALLEL SW CLOSED" on LCD of each module.
4. Press simultaneously the two ON/OFF buttons on the UPS-control panel (PMD) on all control panels. Unit will start-up and after about 60 seconds the mimic panel will show:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	RED
BATTERY	Green

5. Make sure that the bypass LED is green, then open the Maintenance Bypass Switch IA1 (position OFF).
6. Using LDC panel, select the COMMANDS menu and choose command "LOAD TO INVERTER". This will transfer the LOAD to Inverter on the complete system (all units). On LCD panel "LOAD PROTECTED" will appear.

THE LOAD IS NOW SUPPLIED BY INVERTER POWER AND IS PROTECTED

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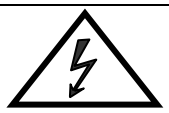
5.2 REPLACEMENT OF UPS-MODULE

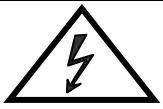
5.2.1 Replacement of UPS-Module in Single-Module Systems



WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

5.2.1.1 How to Extract a UPS-Module in SINGLE MODULE Systems



WARNING!

The weight of a UPS module can reach 60kg, therefore it can be lifted only by 2 persons. Potential dangers:

the ups module due to its heavy weight, if removed inappropriately, can cause serious injury or damage should the module fall down.

note:
it is forbidden that the modules are handled by single persons.

SUITABLE LIFTING TOOLS RESPECTIVELY SAFEGUARD PLATFORMS AGAINST EVT. FALL DOWN ARE TO BE PLANNED. THE MODULE MUST NEVER BE CARRIED BY ONE PERSON ONLY.

If your **CONCEPTPOWER DPA™** consists of only one single UPS-Module then perform following steps to extract the module:

1. Reset the Alarm on faulty Module. The audible noise will stop.
   If the Alarm condition persists (the LED-Indicator ALARM will remain red) it means that there is a fault in the UPS-Module.
2. If the load is supplied by the mains in Bypass-Mode (Eco-Mode) the Maintenance Bypass (IA1) may be closed by turning it to position “ON”.
   NOTE: If the load is on inverter then before closing the Maintenance Bypass IA1, transfer load to bypass by means of the command “LOAD TO BYPASS” in submenu COMMANDS. On LCD: “LOAD NOT PROTECTED” will appear.
3. Close Maintenance Bypass Switch IA1 (position ON)
   On LCD: “MANUAL BYP IS CLOSED” will appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	RED
BATTERY	Green

The load is now directly supplied by mains and is not protected

NOTE!	**THE LOAD IS NOW DIRECTLY SUPPLIED BY MAINS AND IS NOT PROTECTED.**

4. Open the Parallel Isolator Switch IA2 (switch to position “OFF”) of the faulty UPS-Module. The UPS-Module is now disconnected from output;
5. Press both ON/OFF Buttons on UPS-Module simultaneously;
6. Open battery fuses/breakers on the internal (if any) and the external battery cabinet or rack;
7. Disconnect cables from connectors JD7
8. Unscrew the four screws on the front side of the module that are fixing it to the UPS-frame;
9. Pull Module only partly horizontally by means of the 2 black handles until the rear connectors are disconnected.

WARNING!	**THE LOAD IS NOW DIRECTLY SUPPLIED BY MAINS AND IS NOT PROTECTED.**

WARNING!	**BEFORE DRAWING THE UPS-MODULE COMPLETELY OUT, WAIT 2 MINUTES UNTIL THE INTERNAL DC-CAPACITORS ARE DISCHARGED.**

10. Draw UPS-Module by pulling it out horizontally:
    NOTE: Two persons are needed to pull out the module from the UPS-Frame. The weight of a DPA 50, 40 kW module is 60kg (the weight of DPA 10 , 8kW module is 24kg)
11. Insert new UPS-Module or cover the opening (UPS-Module Compartment) with appropriate protection cover immediately and fix with four screws.

WHILE THE UPS IS OPERATING IN THE MAINTENANCE BYPASS-MODE THE LOAD IS NOT PROTECTED AND IN THE EVENT OF A MAINS FAILURE THE LOAD SUPPLY WILL BE INTERRUPTED AND THE LOAD WILL CRASH.

5.2.1.2 How to Fit Back a UPS-Module in SINGLE-MODULE-Systems

If your **CONCEPTPOWER DPA** ™ consists of only one single UPS-Module then perform following steps to fit back the new module:

1. Remove UPS-Module compartment protection cover by unscrewing four screws on the front.
2. Slide two thirds of UPS-Module into dedicated UPS-compartment (make sure not to plug the UPS-Module into the rear connector).
   Connect Control Panel cable to connector JD7.
   Push UPS-module to its final position and push strongly to assure good contact on the rear plugs.
   NOTE: Two persons are needed to pull out the module from the UPS-Frame. The weight of a DPA 50, 40 kW module is 60kg (the weight of DPA 10 , 8kW module is 24kg)
3. Tighten the four screws on the front of module.

4. Check if the LED LINE1 and battery is green. If yes, mains voltage is OK;
   On the LCD: “LOAD OFF, SUPPLY FAILURE” will appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	OFF
BYPASS	OFF
INVERTER	OFF
BATTERY	Flashing Green

5. Make sure the bypass fuses F2 are inserted (front of Module);
6. Close internal and external battery fuses/breaker (if available);
7. Press simultaneously both “ON/OFF” Buttons to start-up UPS.
   LCD panel must display: “LOAD DISCONNECTED PARALLEL SWITCH OPEN” and the LED-indicator will appear as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	OFF
INVERTER	Green
BATTERY	Green

8. Transfer load to mains and inverter for testing using submenu COMMANDS
9. Transfer Load to Bypass-Mode by means of COMMAND “LOAD TO BYPASS”
10. Verify the status (Load on Bypass, Eco-Mode) by checking the LED-indicators as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	OFF
BATTERY	Green

11. Close Parallel Isolator (IA2);
12. Open Maintenance Bypass (IA1) by turning it to position “OFF”. The load is now supplied by the static bypass.
13. Transfer load to Inverter-Mode by means of COMMAND “LOAD TO INVERTER”. On LCD: “LOAD PROTECTED” will appear.

THE LOAD IS NOW PROTECTED BY THE PMC

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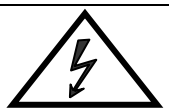
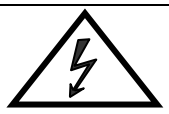
5.2.2 Replacement of UPS-Module in Redundant Multi-Module System



WARNING! **THE WEIGHT OF A UPS MODULE CAN REACH 60KG, THEREFORE IT CAN BE LIFTED ONLY BY 2 PERSONS. THE MODULE MUST NEVER BE CARRIED BY ONE PERSON ONLY.**



WARNING! **MAKE SURE THE INTERNAL DC-CAPACITORS (ELCO) HAVE BEEN DISCHARGED WAITING AT LEAST 10 MINUTES. HOW TO EXTRACT A MODULE IN REDUNDANT MULTI-MODULE SYSTEM**

5.2.2.1 How to Extract a Module in Redundant Multi-Module System

If in a redundant parallel system a UPS-module is faulty, the load will continue to be protected by the operating modules On-Line-Mode (Inverter-Mode) and the faulty Module may be replaced without having to transfer the load to bypass!

To extract the faulty module from the UPS-Frame in a Redundant Multi- Module Configuration proceed as follows:

1. Identify the faulty Module with the Alarm condition and RESET the Alarm. The audible noise will stop. If the Alarm conditions persists (the LED-Indicator ALARM is red) there is a fault in the UPS-Module.
2. Verify that load is supplied by inverter of the other modules running by checking the LCD indication LOAD PROTECTED. Verify load measures on the operating modules.
3. Turn the faulty module OFF by pressing simultaneously both “ON/OFF” buttons.
   On the LCD: “LOAD OFF, SUPPLY FAILURE” should appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	OFF
BYPASS	OFF
INVERTER	OFF
BATTERY	Flashing Green

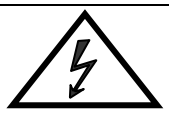
4. Open the corresponding Parallel Isolator Switch IA2. LCD panel must show: PARALLEL SW OPEN.
5. Remove the 4 fixation screws and slide out the UPS-Module (10cm) paying particular attention to the cable connected to JD7. This operation will disconnect module by the power connection located on the back of the cabin.
6. With the module OFF, disconnect any connected cable as JD7.
7. Pull the module out.

ATTENTION: BEFORE DRAWING THE UPS-MODULE COMPLETELY OUT, WAIT 2 MINUTES UNTIL THE INTERNAL DC-CAPACITORS ARE DISCHARGED.

NOTE: Two persons are needed to pull out the module from the UPS-Frame. The weight of a DPA 50, 40 kW module is 60kg (the weight of DPA 10 , 8kW module is 24kg)

8. Screw the protection cover on the empty area left empty by the module with the 4 fixation screws.

5.2.2.2 How to insert a module in a Redundant Multi Module System



WARNING! **THE WEIGHT OF A UPS MODULE CAN REACH 60KG, THEREFORE IT CAN BE LIFTED ONLY BY 2 PERSONS. THE MODULE MUST NEVER BE CARRIED BY ONE PERSON ONLY**

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In a Redundant Parallel system one module can be re-introduced on its original location without affecting normal system operation. Load will be protected by the other modules running ON-LINE.

Module must be previously set according to system personalization. Please make sure with your nearest service centre for correct settings.

1. Remove the protection cover by unscrewing the 4 fixation screws on the front.
2. Lift the module to its destination position. See above note concerning weights.
3. Slide two thirds of UPS module into dedicated compartment (make sure not to plug the UPS-Module into the rear connector). Connect Control Panel cable to connector JD7.
   Push UPS-module to its final position and push strongly to assure good contact on the rear plugs.
   Tighten the four screws on the front of module;
4. Check if LED LINE1 and battery is green. If yes, mains voltage is OK;
   On the LCD: “LOAD OFF, SUPPLY FAILURE” will appear and the LED-indicator will indicate as shown below:

LED Indicator	**Colour**
LINE 1	Green
LINE 2	OFF
BYPASS	OFF
INVERTER	OFF
BATTERY	Flashing Green

5. Make sure the bypass fuse F2 is inserted (front of Module);
6. Close internal and/or external battery fuses/breaker of the new Module
7. Press both “ON/OFF” Buttons simultaneously to start-up UPS.
8. Wait 60 seconds, LCD panel must display: “LOAD DISCONNECTED PARALLEL SWITCH OPEN” and the LED-indicator will appear as shown below:

LED Indicator	**Colour**
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	OFF
BATTERY	Flashing/Green

9. Transfer load to Inverter-Mode by means of COMMAND “LOAD TO INVERTER” of the control panel. LED-indicator will appear as shown below:

LED Indicator	**Colour**
LINE 1	Green
LINE 2	Green
BYPASS	OFF
INVERTER	Green
BATTERY	Green

10. Stop the module by pressing simultaneously both “ON/OFF” buttons.
11. Close the Parallel Isolator Switch IA2 corresponding to the module.
    LCD panel must show the message PARALLEL SW CLOSED.
12. Press simultaneously both “ON/OFF” buttons.
    Module will restart automatically connecting load to inverter and run in parallel with other ON LINE modules. LCD panel must show LOAD PROTECTED indication.

THE LOAD IS NOW PROTECTED BY THE CONCEPTPOWER DPA ™

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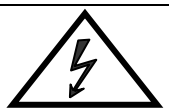
5.2.3 Replacement of a Module in Capacity Multi-Module System



WARNING!

THE WEIGHT OF A UPS MODULE CAN REACH 60KG, THEREFORE IT CAN BE LIFTED ONLY BY 2 PERSONS. THE MODULE MUST NEVER BE CARRIED BY ONE PERSON ONLY

5.2.3.1 How to Extract a Module in a Capacity Multi-Module System

If in capacity parallel system a UPS-Module experiences a fault and there is not enough capacity left to protect the load by the remaining operating UPS-Modules, the load will automatically be transferred to bypass (Bypass-Mode or Eco-Mode) and will continue to be supplied by the mains power supply.

To extract the faulty module from the UPS-Frame in a Capacity **Multi-Module** System proceed as follows:

1. Identify the faulty Module with the Alarm condition and RESET the Alarm. The audible noise will stop. If the Alarm conditions persists (the LED-Indicator ALARM is red) there is a fault in the UPS-Module.
2. Verify that the load is on Bypass and is supplied by the mains power (Bypass-Mode or Eco-Mode) on all three UPS-Modules; in the majority of the events the LED-indicators on Control Panel of the Faulty Module will show:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	RED
BATTERY	Green

3. Whereas the LED-indicators on the Control Panels of the other two Operating Modules will show

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	OFF
BATTERY	Green

4. Close Maintenance Bypass Switch IA1 (position ON)
5. On LCD: “MANUAL BYP IS CLOSED” will appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	RED
BATTERY	Green

The load is now directly supplied by mains and is not protected

6. Open the Parallel Isolator Switch IA2 (switch to position “OFF”) of UPS-module to be replaced. The UPS-module is now disconnected from the output;
7. Press both ON/OFF Buttons on UPS-Module simultaneously;
8. Open corresponding battery fuses;

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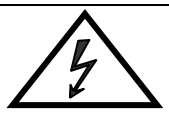
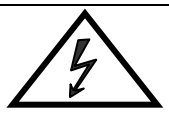
9. Remove the 4 fixation screws and slide out the UPS-Module (10cm) paying particular attention to the cable connected to JD7. This operation will disconnect module by the power connection located on the back of the cabin.
10. Disconnect cables from connectors JD7.

ATTENTION: BEFORE DRAWING THE UPS-MODULE COMPLETELY OUT, WAIT 2 MINUTES UNTIL THE INTERNAL DC-CAPACITORS ARE DISCHARGED.

11. Draw UPS-Module by pulling it out horizontally:
    NOTE: Two persons are needed to pull out the module from the UPS-Frame. The weight of a DPA 40 , 40 kW module is 60kg (the weight of the DPA 10, 8kW is 24 kg).
12. Insert new UPS-Module or cover the opening (UPS-Module Compartment) with appropriate protection cover immediately and fix with four screws.



WARNING! **MAKE SURE THE INTERNAL DC-CAPACITORS (ELCO) HAVE BEEN DISCHARGED WAITING AT LEAST 10 MINUTES**



WARNING! **THE LOAD IS NOW DIRECTLY SUPPLIED BY MAINS AND IS NOT PROTECTED**

5.2.3.2 How to Fit Back a Module in a Capacity Multi-Module System

To replace a Faulty Module in a **Capacity Multi-Module System** perform following steps:

1. Remove UPS-Module compartment protection cover by unscrewing four screws on the front.
2. Slide two thirds of UPS-Module into dedicated UPS-compartment (make sure not to plug the UPS-Module into the rear connector).
   Connect Control Panel cable to connector JD7.
   Push UPS-module to its final position and push strongly to assure good contact on the rear plugs.
   NOTE: Two persons are needed to pull out the module from the UPS-Frame. The weight of a DPA 40 , 40 kW module is 60kg (the weight of the DPA 10, 8kW is 24kg).
3. Tighten the four screws on the front of module;
4. Check if LED LINE1 and battery are green.
   On the LCD: “LOAD OFF, SUPPLY FAILURE” will appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	OFF
BYPASS	OFF
INVERTER	OFF
BATTERY	Flashing Green

5. Make sure the bypass fuse F2 is inserted (front of Module);
6. Close internal and/or external battery fuses/breaker of the new Module
7. Press both “ON/OFF” Buttons simultaneously to start-up UPS.
   LCD panel must display: “LOAD DISCONNECTED PARALLEL SWITCH OPEN” and the LED-indicator will appear as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	OFF
BATTERY	Green

8. Transfer load to mains and inverter for testing using submenu COMMANDS
9. Transfer Load to Bypass-Mode by means of COMMAND “LOAD TO BYPASS
10. Verify the status LOAD ON BYPASS

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	Green
INVERTER	OFF
BATTERY	Green

11. Verify that the remaining UPS-Modules are also on Bypass;
12. If all three UPS-Modules are on Bypass, Close Parallel Isolator Switch IA2 of New Module (position ON); on LCD should appear “PARALLEL SW IS CLOSED”.
13. Open Maintenance Bypass (IA1) by turning it to position “OFF”. The load is now supplied by the static bypass of all three Modules. Check LED-indicators on control panels.
14. Transfer load to Inverter-Mode by means of COMMAND “LOAD TO INVERTER” on any one of three control panels. On LCD: “LOAD PROTECTED” will appear and the LED-indicator will indicate as shown below:

LED Indicator	Colour
LINE 1	Green
LINE 2	Green
BYPASS	OFF
INVERTER	Green
BATTERY	Green

THE LOAD IS NOW PROTECTED BY THE CONCEPTPOWER DPA ™

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6.1 MULTI-CABINET CONFIGURATION

6.1.1 Concept of Multi-Cabinet Configuration

The **CONCEPTPOWER DPA** ™ Cabinets may be paralleled for power capacity or for redundancy indefinitely. Every standard **CONCEPTPOWER DPA** ™ is provided with the parallel option and therefore no time-consuming upgrading is necessary on site.

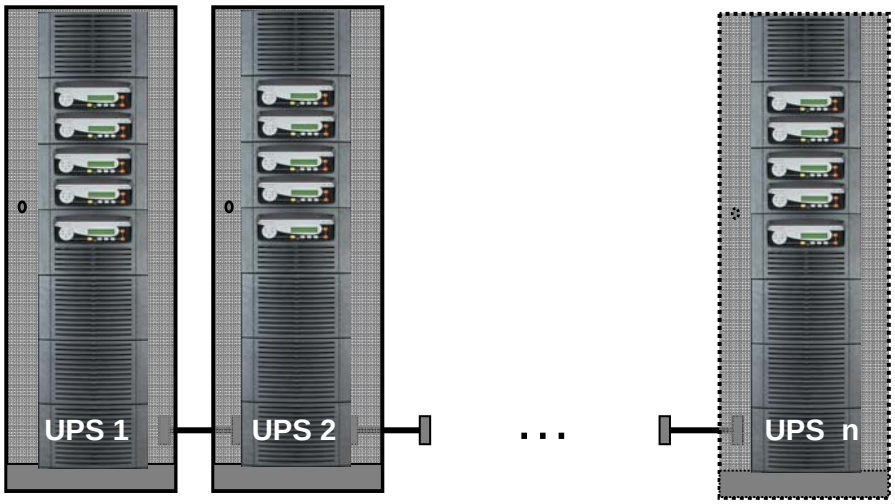

Fig. 1.1. **CONCEPTPOWER DPA** ™ Multi-Cabinet Chain.

The Multi-Cabinet Chain is based on a decentralized bypass architecture i.e. every UPS is provided with its own static bypass. In a parallel system there is always one Master Module and the other Modules are slaves. If at any time the master is faulty the next UPS (former slave) will immediately take over the master function and the former master will switch off.

Every UPS unit in a parallel configuration is provided with a proper output parallel Isolator (IA2) which, when opened isolates the corresponding unit from the parallel system. Once the parallel isolator (IA2) of a unit is open that unit (module) is isolated from the rest of the parallel system and therefore does not provide power to the output.

For example if you perform the command “LOAD TO BYPASS” on any unit, all the units will transfer the load simultaneously to mains and if you perform the command “LOAD TO INVERTER” on any unit all the UPS’s will simultaneously transfer the load to the inverters.

The **CONCEPTPOWER DPA** ™ is paralleled for redundancy (highest availability) or for power parallel systems.

IMPORTANT: The BYPASS MODE (ECO-MODE) function of a parallel systems is the same as in single units of **CONCEPTPOWER DPA** ™. If in a parallel UPS system the load is transferred to the BYPASS (load on mains) and if the mains fails, the UPS’s will all be automatically transferred to inverter within 5msec.

NOTE!

IN ORDER TO PROVIDE THE LOAD WITH MAXIMUM PROTECTION RITTAL ALWAYS RECOMMENDS THAT THE LOAD BE SUPPLIED BY THE INVERTER (ON-LINE-MODE).

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6.1.2 Installation Instructions

6.1.2.1 Introduction

WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

NOTE: IN ORDER TO ACHIEVE EQUAL LOAD SHARING BETWEEN THE UPS-CABINETS, THE INPUT CABLE LENGTHS FROM THE INPUT DISTRIBUTION BOARD TO THE UPS AND FROM THE OUTPUT CABLE TO THE OUTPUT DISTRIBUTION BOARD SHOULD BE THE SAME RESPECTIVELY.
WHEN CABLING THE UPS'S BEWARE TO CONNECT INPUT AND OUTPUT WIRES TO THE CORRESPONDING TERMINALS, RESPECTING THE SAME PHASE SEQUENCE ON ALL UPS CABINETS.
EXAMPLE: PHASE1 OF UPS1 = PHASE1 OF UPS2 = …… = PHASE1 OF UPS n

6.1.2.2 Paralleling of UPS-Cabinets

6.1.2.2.1 Connection of Parallel Communication Cables (BUS-lines)

For the correct performance of different parallel functions and operations the parallel units communicate continuously between each other. This is achieved by means of the so-called communication BUS-Lines.

After terminating the input and output cabling of each single UPS, it is necessary to connect the units together to form the parallel system. For this purpose a communication BUS line is connected sequentially between the units. Connect communication BUS lines according to Figure 1.2.

NOTE!

CONNECT THE BUS CABLES ONLY WITH SWITCHED OFF UPS AND OPENED PARALLEL ISOLATORS IA2. RESPECT THE FOLLOWING CONNECTION SEQUENCES.

1. Fit the Parallel Adapter over the Connector JD8 on all UPS-cabinets
2. Set DIP Switch SW2-2 on each Parallel Adapter depending on the UPS Cabinet in the parallel cabinet configuration (see section 6 chapter 1.2.2.2)
3. Connect PORT JD6 on Parallel Adapter of UPS-Cabinet 1and PORT JD5 of Parallel Adapter of UPS-Cabinet 2 with the corresponding BUS-Cable;
4. Connect PORT JD6 on Parallel Adapter of UPS-Cabinet 2 and PORT JD5 of UPS-Cabinet 3 with the corresponding BUS-Cable
5. Continue in the same manner for the remaining UPS-Cabinets.

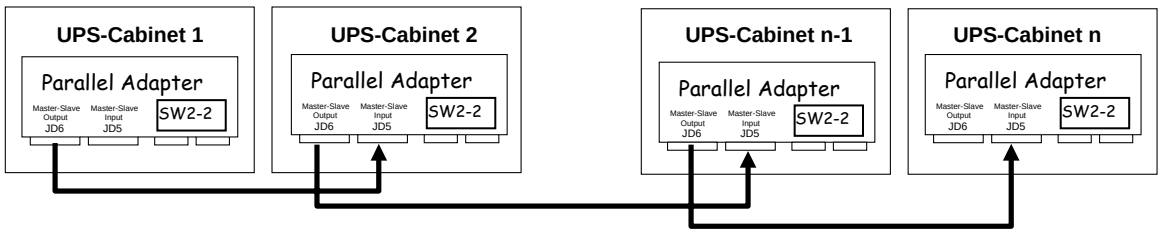
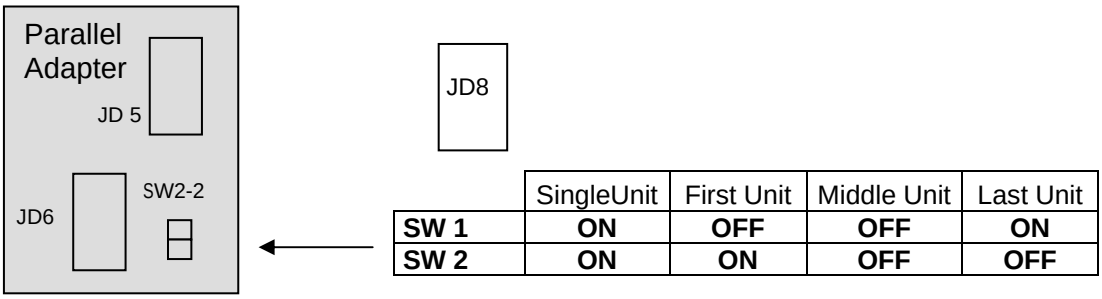


Figure 1.2.Connection of the Bus Lines when paralleling UPS-Cabinets by means of Parallel Adapters.

6.1.2.2.2 Parallel Adapter and DIP-Switch SW2-2

If the UPS-CABINETS are paralleled the Parallel Adapter will be placed on the Connector JD8 on the distribution panel and the communications cables between the cabinets will be connected through the connectors JD5 and JD6, as we are doing now.

NOTE: set the Switch SW2-2 correctly according to the corresponding cabinet configuration.



	SingleUnit	First Unit	Middle Unit	Last Unit
SW 1	**ON**	**OFF**	**OFF**	**ON**
SW 2	**ON**	**ON**	**OFF**	**OFF**

6.1.2.3 DIP-Switch SW1-9 Settings

Before starting up the parallel system it is necessary to set the DIP Switches SW1-9 to their correct positions.

6.1.2.4 DIP Switch SW1-9

The DIP Switch SW1-9 is located on every Cabinet (CONCEPTPOWER DPA ™) With this switch it is possible to determine the **"position of an CONCEPTPOWER DPA ™ - Cabinet"** in a Multi-Cabinet Chain. Define each **CONCEPTPOWER DPA ™** - Cabinet in a Multi-Cabinet Chain as:

1. The **"First"**,
2. The **"Middle"** (there may be more than one) and
3. The **"Last"**

Cabinet in the Multi-Cabinet Chain by setting the DIP Switch SW1-9 on each cabinet according to the Table below:

SW1-9	Single Cabinet	First Cabinet	Middle Cabinet	Last Cabinet
1	ON	ON	OFF	ON
2	ON	OFF	OFF	ON
3	ON	ON	OFF	OFF
4	ON	ON	OFF	ON
5	ON	ON	OFF	ON
6	ON	ON	OFF	ON
7	ON	ON	OFF	ON
8	ON	ON	OFF	ON
9	ON	ON	OFF	ON

After having set the SW1-9 on all the **CONCEPTPOWER DPA ™** - Cabinets correctly the UPS's may be commissioned

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6.1.2.5 ON/OFF – Main Buttons

The ON/OFF-Buttons serve to shutdown the UPS-system for service or maintenance or for emergency reasons.

! NOTE!	**WHEN BOTH ON/OFF BUTTONS ON ALL UPS MODULES IN A PARALLEL SYSTEM ARE PUSHED THE POWER SUPPLY TO THE LOAD WILL BE INTERRUPTED.**

6.1.2.6 Parallel Isolator (IA2)

Every UPS-unit (Means each Module) is provided with a parallel isolator IA2. The parallel isolator is an important element of the UPS-unit, that allows the isolation of a Modul from the parallel system without the need to transfer the load to bypass.

! NOTE!	**IA2 OPEN:** **THE CORRESPONDING UPS-MODULE IS ISOLATED FROM THE OUTPUT. THERE IS NO COMMUNICATION BETWEEN THE ISOLATED UNIT AND THE REST OF THE PARALLEL SYSTEM. THE ISOLATED UPS-MODULE MAY BE REPLACED WITHOUT COMPROMISING THE REST OF THE SYSTEM.** **IA2 CLOSED:** **THE CORRESPONDING UPS IS BEING ADDED TO THE REST OF THE PARALLEL SYSTEM.** **IMPORTANT: BEFORE CLOSING THE IA2 OF A UPS-MODULE BE SURE THAT THE STATUS OF THAT UPS-MODULE IS THE SAME AS OF THE REST OF THE OPERATING UPS-MODULE WITH CLOSED IA2.** **EXAMPLE: IF ALL UPS'S WITH CLOSED IA2 ARE ON INVERTER, MAKE SURE THAT THE UNIT ON WHICH ISOLATOR IA2 IS BEING CLOSED IS ALSO ON INVERTER.**

6.1.2.7 Maintenance Bypass (IA1)

There are two types of Parallel System Configurations: redundant and capacity parallel systems (see SECTION 5).

6.1.2.7.1 Redundant Parallel Configuration

In a redundant parallel system a UPS-module may easily be isolated from the parallel system by opening the respective isolator (IA2). It is now possible to operate or shut down this unit without influencing the rest of the parallel system. The rest of the parallel system will continue to protect the load. The isolated UPS-Module may be replaced without the need of transferring the load to bypass by means of the Maintenance Bypass (IA1).

6.1.2.7.2 Capacity Parallel Configuration

In the event of a fault in one of the UPS-Modules in a capacity parallel system the load will automatically be transferred to static bypass (mains). In order to replace the faulty module the load must be transferred to mains by means of Maintenance Bypass (IA1).

6.1.2.8 ECO-MODE (BYPASS MODE) in Parallel Systems

The Eco-Mode function in a Parallel System is the same as in Single Systems. If in a **CONCEPTPOWER DPA ™** Parallel System the load is supplied by the mains(load on mains) and in the event of mains failure, **all UPS's will automatically transfer the load back to the inverters with 5msec.**

! ***In order to provide the load with maximum protection NEWAVE always recommends that the load be supplied by the inverter (ON-LINE-Mode).***

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6.1.3 Commissioning of Multi-Cabinet Configuration

WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

6.1.3.1 Start-up of a Multi-Cabinet Configuration

Before starting up a Multi-Cabinet Configuration verify that:

1. All the input and output cabling has been performed correctly according to section 2 of this User Manual;
2. The parallel communication cables have been connected correctly according to Paragraph 1.2.2
3. All the DIP Switches for the Modules and CONCEPTPOWER DPA ™ - Cabinets been set correctly according to Paragraph 1.2.3
4. All the internal (if any) and /or external battery cabinets/racks have been connected correctly

The start-up of a Multi-Cabinet Configuration may be performed in analogy to the start-up procedures for a single CONCEPTPOWER DPA ™ - Cabinet described in Paragraph 1.1 of section 5.

6.1.3.2 Shutdown of Multi-Cabinet Configuration

Before shutting-down of a Multi-Cabinet Configuration make sure that the loads do need power protection and that they are disconnected.

The UPS may be shut down completely if the loads do not need any power supply. Therefore the steps in this Paragraph are to be performed only after the load has been disconnected and does not need any power supply.

To perform a complete shutdown of a Multi-Cabinet Configuration proceed in analogy to the shutdown procedures described in Paragraph 1.2 of section 5.

6.1.3.3 Replacement of a Faulty UPS-Module in a Multi-Cabinet Configuration

If in a Multi-Cabinet Configuration a UPS-Module fails proceed in replacing the UPS-Module in analogy with the replacement procedures described in section 5 of this User Manual

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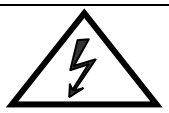
7.1 MAINTENANCE

7.1.1 Introduction



WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

To ensure an optimum operation of the **CONCEPTPOWER DPA** ™ and a continuous and efficient protection of the connected load it is recommended to check the batteries every 6 months, depending on the ambiance temperature.

7.1.2 User Responsibilities

There are no user serviceable parts contained within the UPS so the maintenance responsibilities of the user are minimal. To maximize the useful working life and reliability of the UPS and its batteries, the environment in which the UPS operates should be kept cool, dry, dust and vibration free. The batteries should be hold fully charged.

7.1.3 Routine Maintenance

The UPS is designed to receive regular preventative maintenance inspections. These preventative maintenance inspections are essential to ensure that both the useful working life and the reliability of the UPS are maximized. When the UPS is commissioned, the commissioning field service engineer will attach a service record book to the front of the UPS and this will be used to record the full service history of the UPS. Preventative maintenance inspections involve working inside the UPS, which contains hazardous AC and DC voltages. Only NEWAVE trained or agreed service personnel and authorized field service engineers are fully aware of all of the hazardous areas within the UPS.
During a preventative maintenance inspection the field service engineer will carry out the following checks:

- Site/enivrement conditions;
- Integrity of electrical installation;
- Cooling airflow;
- Rectifier operation and calibration;
- Inverter operation and calibration;
- Static switch operation;
- Battery status;
- Load characteristics;
- Integrity of alarm and monitoring systems;
- Operation of all installed options

7.1.4 Battery Test

The battery test takes approx. 3 minutes and should be performed only if:

- there are no alarm conditions
- the battery is fully charged
- mains is present.

The battery testing can be carried out independently of the operation mode (OFF-LINE or ON-LINE) and whether or not the load is connected. The battery test procedure can be performed from the UPS front panel. See “Operation” section 4 / 1.3.5.

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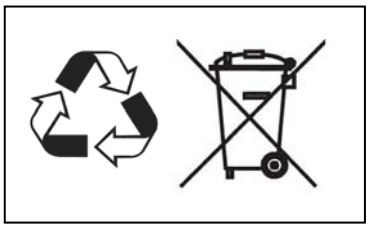
7.1.5 Battery Maintenance

The battery maintenance shall be done by an authorized Newave Service Partner.

7.1.6 Battery Disposal and recycling

Batteries contain dangerous substances that will harm the environment if thrown away. If you change the batteries yourself, call qualified organizations for battery disposal and recycling.



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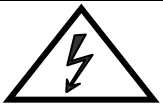
8.1 TROUBLESHOOTING



WARNING!

THE OPERATIONS DESCRIBED IN THIS CHAPTER MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM A AGENT AUTHORIZED BY THE MANUFACTURER.

8.1.1 Alarms

In the event of an alarm condition the red LED-Indicator “Alarm” and the audible alarm will turn on.
In this case proceed as follows:

1. Silence the audible alarm by pressing the button "Reset".
2. Identify the cause of the alarm condition by means of the EVENT LOG in the MAIN menu.
3. In case of doubts please contact the nearest Service centre.
4. Fault identification and rectification information is given on the following pages.

8.1.2 Menu, Commands, Event Log And Measurements

In section 4 there is a detailed description of the Menu, Commands, Event Log and Measurements that can be operated and displayed on the LCD. The List of Alarms and Messages are shown in the Annexe.

8.1.3 Fault Identification and Rectification

The major alarm conditions that will be encountered are:

Alarm Condition	Meaning	Suggested Solution
UPS FAULT	There is a fault in the UPS and therefore normal operation cannot be guaranteed	Call the authorised service centre for assistance
MAINS BYP/RECT FAULT	Mains power supply is outside prescribed tolerance	The input power to UPS is too low or missing. If site power appears to be OK, check the input circuit breakers etc. supplying the UPS
OUTPUT SHORT	There is a short circuit at the output of UPS (on load side)	Check all output connections and repair as required.
OVERLOAD	Load exceeds the UPS rated power	Identify which piece of equipment is causing the overload and remove it from the UPS. Do not connect laser printers, photocopiers, electric heaters, kettles etc. to the UPS
OVERTEMPERATURE	UPS temperature has exceeded the allowed value	Check the ambient temperature of the UPS is less than 30° C. If the ambient temperature is normal call the authorised service centre for assistance.
BATTERY CHARGER OFF	The attached battery and the battery charger set-up do not correspond or battery charger fault	Call the authorised service centre for assistance.
INVERTER FAULT	Inverter is faulty.	Call the authorised service centre for assistance.
SYNCHRON FAULT	The inverter and mains are not synchronised.	The frequency of the input voltage to the UPS is outside operational limits and the UPS static bypass has been temporarily disabled.
BATTERY IN DISCHARGE	Battery is near end of autonomy	Shutdown load connected to UPS before the UPS switches itself off to protect its batteries
MANUAL BYP IS CLOSED	Maintenance Bypass closed. Load supplied by mains	This alarm is only displayed if the UPS is on Maintenance Bypass

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9.1 OPTIONS

9.1.1 Introduction

The **CONCEPTPOWER DPA** ™ is provided with the following accessories:

- REMOTE SHUT DOWN FACILITIES
- GENERATOR ON FACILITIES
- 2 CUSTOMER IN FUNTIONS (ON REQUEST)
- TEMPERATURE SENSOR FOR TEMP. DEPENDING BATTERY CHARGERING
- SOFTWARE FOR AUTOMATIC SHUTDOWN AND MONITORING
- SNMP INTERFACES FOR NETWORK MANAGEMENT AND REMOTE MONITORING
- MODEM/ETHERNET INTERFACE FOR NEWAVEWATCH ™ MANAGEMENT SOFTWARE

9.1.2 Remote SHUT DOWN

The REMOTE SHUT DOWN **must** use a normally closed contact, which opens to operate the remode shut down sequence.

The remote shutdown on terminal port X1/1.. X1/2 is located at the bottom of the **CONCEPTPOWER DPA** ™ frame on communication card with terminal blocks X1 …X4. See section 3 / 1.2.1 for details.

In order to allow removal, maintenance or testing of any remote shut down facility without disturbing the normal operation of the UPS, it is recommended that a terminal block, with linking facilities, be installed between the UPS and the stop button.

1. Use a screened cable with 1 pair (section of wires 0.5 mm^2) and maximum length of 100 m.
2. Connect the cable as shown in Fig. 1.2

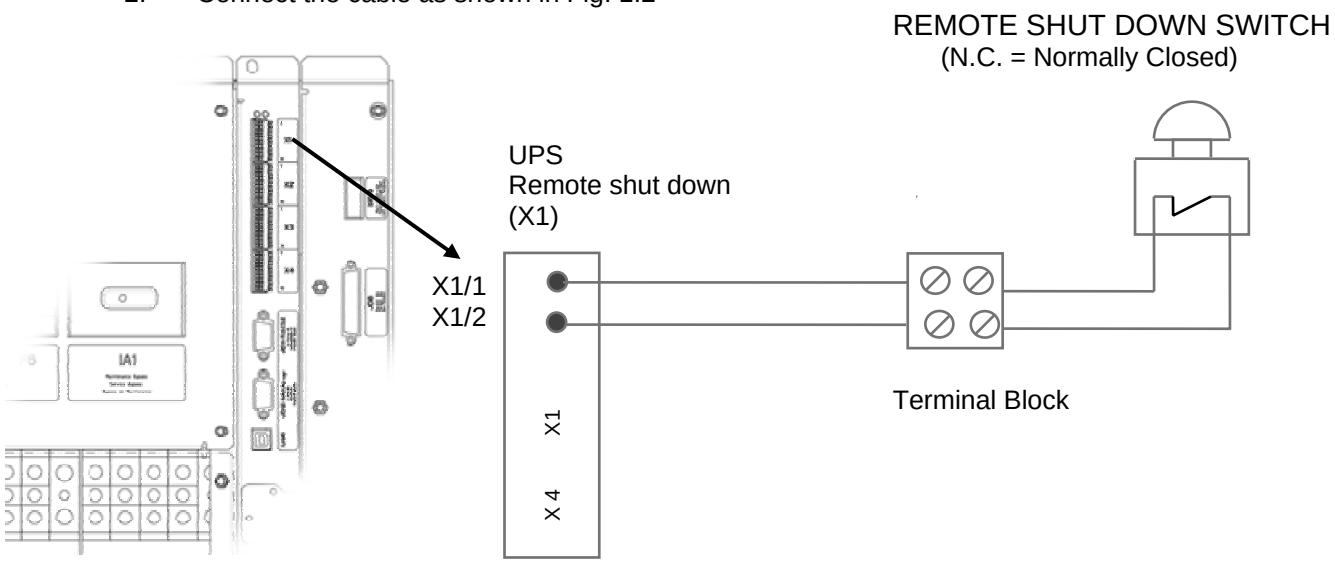


Fig 1.2 Drawing of the wiring for the REMOTE SHUT DOWN SWITCH.

9.1.3 Generator ON Facilities

The Generator ON facility must use a normally open contact that closes to indicate that a generator is running and supplying input power to UPS. It is located at the bottom of the **CONCEPTPOWER DPA** ™ frame on communication card with terminal blocks X1 …X4. See section 3 / 1.2.1 for details

When used, this facility disables the UPS static bypass and prevents the UPS from transferring the load onto the generator power supply.

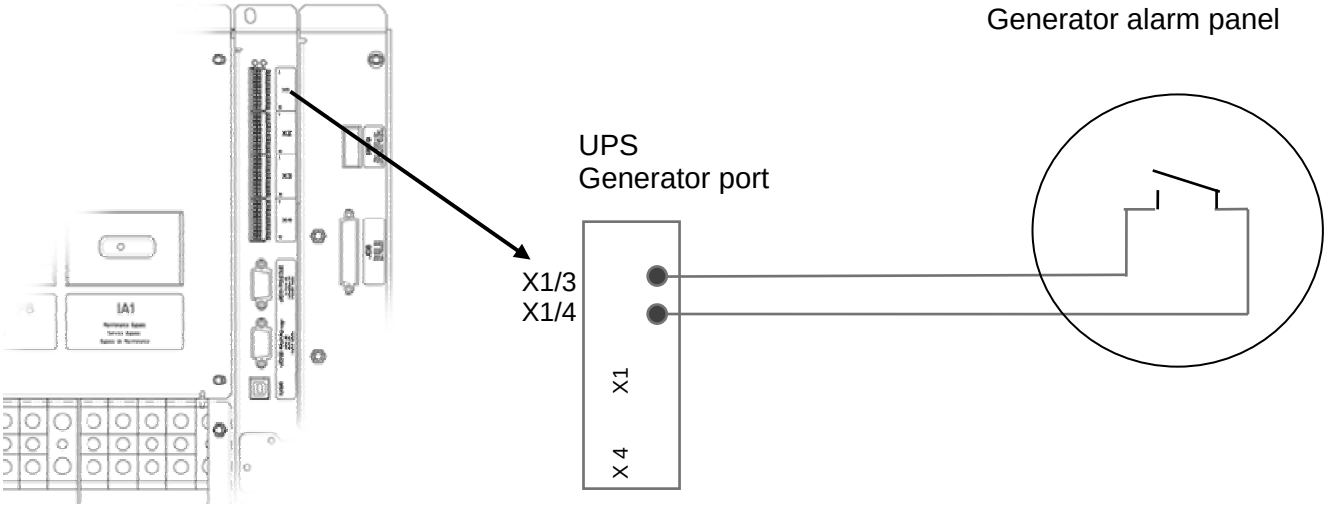


Figure 1.3: Generator ON Connection

9.1.4 Wavemon Shutdown and ManagementSoftware

9.1.4.1 Why is UPS Management important?

By combining a UPS with network management products, such as an SNMP protocol, System-administrators are guaranteed their data and their system will constantly be protected from corruption or data loss even in the event of an extended power failure or when batteries reach a critical low state. In the event of a power disturbance system administrators can also monitor their network from a central location, allowing an early detection of problems. In fact utility power is unreliable at times, ensuring that all network systems have constant power can be a difficult task. The situation becomes even more complex if systems are managed across a Local Area Network (LAN) or Wide Area Network (WAN) around the world.

When a power failure occurs action can be taken to protect the system and its valuable data. If no action is initiated by the operator, this event can seriously damage the system. The UPS software will react automatically in such a case and shutdown the operating system. NEWAVE has found it important to have a complete solution for its UPS and is able to offer a wide range of monitoring/remote controls for assuring the maximum protection degree to the NEWAVE customers.

9.1.4.2 WAVEMON Shutdown and Monitoring Software

WAVEMON Software is an external monitoring and shutdown software which was designed to operate with all NEWAVE UPS products, both with the DRY PORT (Relays) on Terminal block X2 …X4 and RS232 port JD11 on the communication card

The software packet consists of a CD ROM for most diffused operating systems (Windows, Unix, OS/2, DEC VMS, Novell, Apple), a standard connection and a user manual.

The dry port X2…X4 with voltage-free contacts may also be used for automatic shutdown in connection with **WAVEMON Software**. It is necessary to provide a cable of 0.5 mm2 to connect Terminals X2..X4 of the UPS and the serial port of the server.

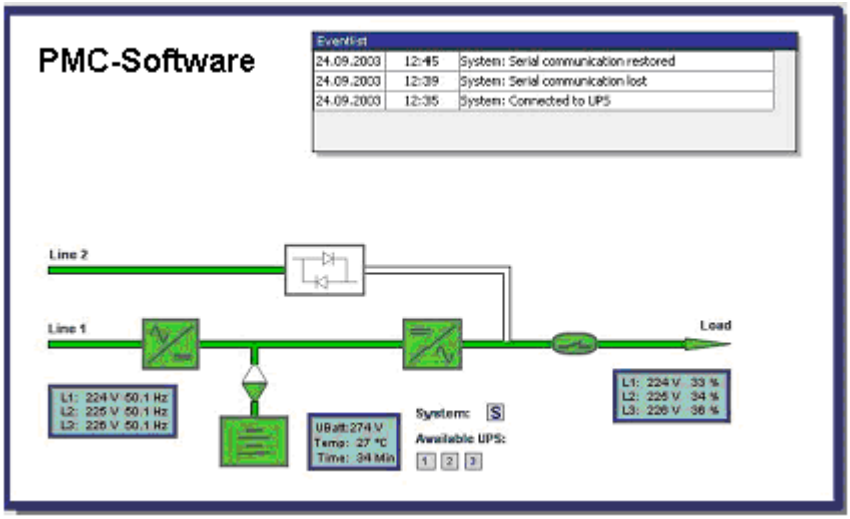


Figure 1.4.2. Monitoring image.

The main characteristics of **WAVEMON Software** are:

- Automatic unattended master/slave shutdown in heterogeneous networks
- On-screen autonomy time / battery time countdown
- On-screen server log off and shutdown procedure
- Extensive logging of all UPS activity and power quality data, with timestamp
- Scheduled UPS economy mode, service mode, other systems status
- Graphical user interface for Windows compatible platforms
- Automatic unattended local shutdown
- Special software modules to close and save open MS-Office documents.
- Compatible for all optional modules like UPSDIALER, SNMP adapters, Temperature sensors, etc.

The UPS-Management Software is a client-/server-application for networks and local workstations. Basically **WAVEMON-Software** consists of two parts: the server-module of the UPS-Management Software is **UPSServ**, which communicates via RS-232 cable with the UPS. Working as a background process the UPSServ collects messages, received from the UPS. The UPSServ interprets received messages and makes them available to the client-module **UPSCli** and to any SNMP-based management station.

When UPSServ detects voltage variations or a power failure it can execute various so called system „event routines“, which for example may shutdown the server or send warning to connected users. These system event routines which are a part of the UPS-Management Software can be adjusted to your demands.

The UPS management software includes with every serial number the licence for using the UPS service on one server with one UPS and an unlimited numbers of connected WINDOWS workstations. When operating with two or more servers a licence for every additional server is required. It doesn't matter if the UPS service runs at that location or if the server is halted by a UPS service via remote command. The same regulations are applicable to the use of remote send/receive modules RCCMD and multiserver shutdown under NT, UNIX and other operating systems. The service programs are generally delivered as a single-licence. To use a single CD ROM to shutdown multiple servers you have to purchase additional CD license keys.

Parallel/redundant UPS systems are also manageable by the software.

The main principle is: let introduce a shutdown of a Server only when strictly necessary. A correct Parallel Handling has therefore to manage a parallel system as a whole and always considering redundancy. Following statements apply:

- Every alarm on any unit is immediately notified, but …
- … a reaction to a severe fault is introduced only when the minimum number of UPS –Modules necessary to supply the load exhibits an alarming situation.
- The real Battery autonomy time of the (whole) parallel system is computed continuously.
- Maintenance on a redundant unit may be executed without annoyance to the management system (supervisor).

In order to be managed, a NEWAVE UPS can be integrated into a network in two ways:

1. By means of the server which is being powered by the UPS and is integrated in the network. In most of the cases the server is used as sub-agent and you only need the PMC-Software without any SNMP Adapter. You need a standard serial connection between the RS232 JD11 port of the UPS and the RS232 port of the computer/server.
2. In some situations it is preferable to interface the network via an SNMP adapter. By this way up to 50 computers can be shut down in a RCCMD environment. RCCMD (Remote Console Command) is an additional software module, which can be triggered by the SNMP device to executes a command (typically a shutdown command) on a remote system.

9.1.5 SNMP CARD/ADAPTER For Network Management /Remote Monitoring

The **S**imple **N**etwork **M**anagement **P**rotocol (SNMP) is a worldwide-standardized communication-protocol. It is used to monitor any device in the network via simple control language. The UPS-Management Software also provides its data in this SNMP format with its internal software agent. The operating system you are using must support the SNMP protocol. We offer our software with SNMP functionality for Novell, OS/2, all Windows running on INTEL and ALPHA, DEC VMS, Apple.

Two types of SNMP interfaces with identical functionality are available: an external SNMP-Adapter (Box) and an internal SNMP-Card. Both can manage a parallel system (N modules) and return either global values - which are consistent for the whole parallel system - or specific values from the single modules.

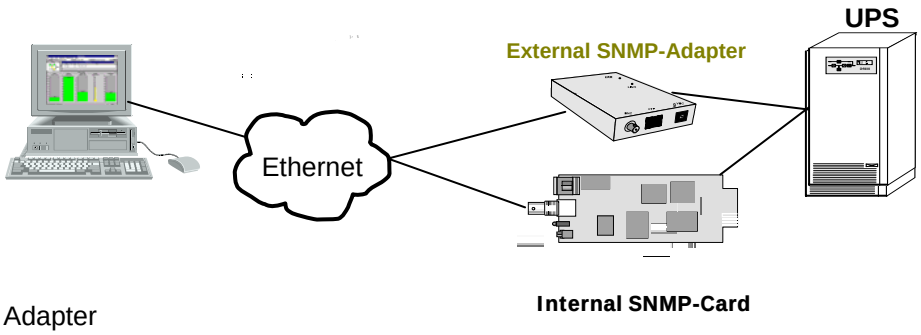


Figure 1.5 SNMP Adapter

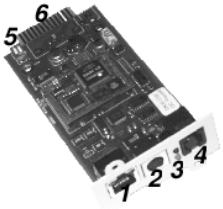
The adapter may be configured via Telnet, HTTP (Web-Browser) or serial connection (Terminal). For normal operation at least one network connection (Ethernet) is required.

The SNMP adapter can be used, utilising the RCCMD send function, for an automatic network wide shut down or just for informing connected users. The shut down procedure can be initiated on a low residual battery autonomy time (downtime) or by a countdown timer which is started at the beginning of the alarm. A shut down is therefore possible without extra input from the operator, and is fully software controlled.

The small (125x70 mm) External SNMP adapter comes with following interfaces:

1. RJ-45 connector for 10/100 Base-T(autoswitchable)
2. Serial Port for configuration (COM2) or optional ModBus interface.
3. Error/Link LED for UPS status
4. Aux Port
5. DIP Switch
6. Serial Port to the UPS (COM1)
7. DC Supply (9 VDC or 9-36 VDC supply, depending on model);

Figure 1.5.1 External SNMP Adapter



The Internal SNMP-Card can be inserted into an appropriate extension slot of the **PMC.** This adapter communicates via the serial port of the UPS and makes a direct multiple server shut down possible without additional SNMP management software.

Figure 1.5.2 Internal SNMP Adapter

For detailed information please see Software Manual provided with the PMC-Software CD ROM.**RCCMD - Remote Console Command module** for a multi-server shutdown. This stand-alone software module is designed to receive and execute a command issued by a remote device. Thanks to RCCMD it is possible to execute a shutdown in an heterogeneous multiplatform network. The new release RCCMD2 is an application available for all Operating Systems, analogous to PMC-Software. Our SNMP Interfaces are compatible to RCCMD.

9.1.6 MODEM/ETHERNET CARD / NewavewatchTM MANAGEMENT SOFTWARE

NewavewatchTM is a redundant remote monitoring and management service which is a part of the Premium Power Protection Concept, providing you with peace-of-mind protection, knowing the mission critical facility is under careful, continuous watch 24/7/365. There are two different solution cards Modem/Ethernet or Modem/GSM to connect the UPS to the outside world.

Continuous monitoring is an affordable insurance policy to detect and warn before they become a crisis. Acquire key performance parameter and productivity information in real-time to empower you with the details needed to better understand machine performance and faster troubleshoot downtime events.
Early warning system, so problems can be addressed before they become a real threat to the load. Professional experts, your virtual service technician onside.
Total transparency of information and actions performed like Notification of all critical status changes, Coordination of equipment service, Reporting of all alarms with priorities.

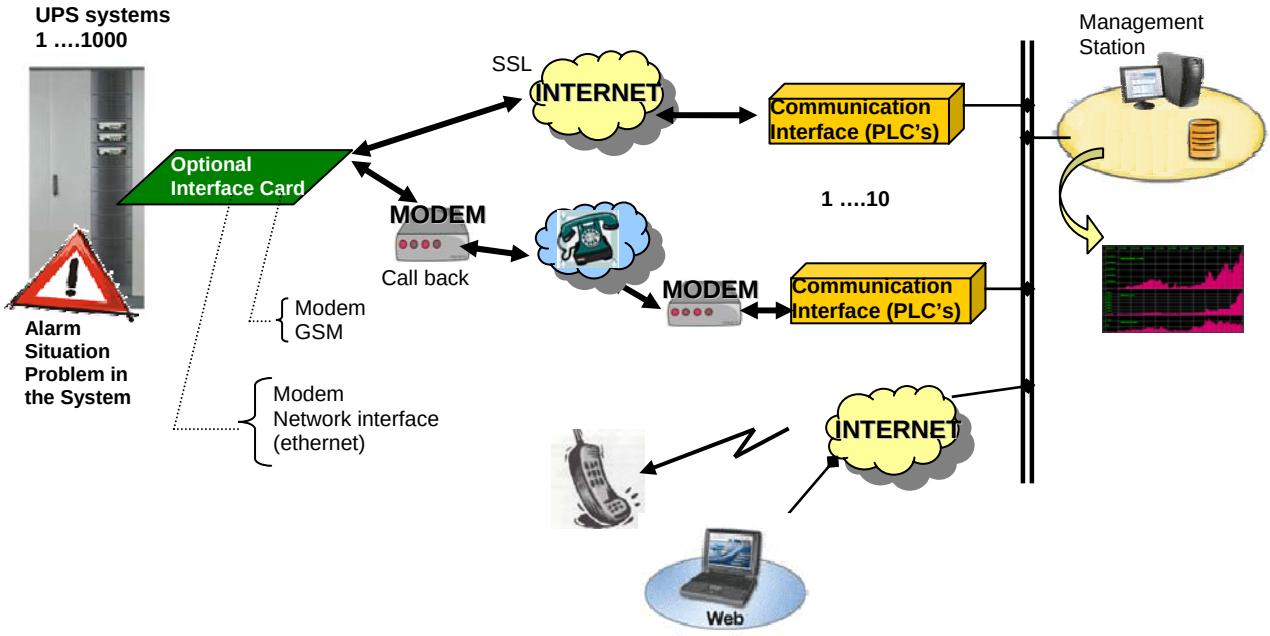
What are the features?

- Redundant and secure communication
- Alarm acknowledgment
- Priority driven Management (with escalation)

Comprehensive Management System

- Reception and management of alarm calls from UPS
- Storage of UPS Data in a database exportable in a CVS-format for easy handling in Excel
- Unlimited number of UPS that can be managed
- User administration with passwords and permission-level
- Administration of Log file
- Data logging with statistical analysis and diagnostics, report
- Visualization of the UPS data
  - ◊ Current status (“single” and “parallel” operation)
  - ◊ Measured values for single or three phase
  - ◊ Recording function including graphs with zooming capabilities for selected measured values
  - ◊ Display of event log file
  - ◊ Display of UPS Parameters
  - ◊ Web Server functionality, for data access from any Web Browser

Watch



Modular Safe-Swap Watch

Continuous Power Protection Availability

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Conceptpower DPA™ Technical Specifications

Conceptpower DPA™ highlights at a glance

- DPA with Safe-Swap Modules (SSM)
  For premium power protection availability
- Low total Cost of Ownership (TCO)
  Cost saving during entire life-cycle
- Flexibility/Scalability
  Ease of power upgrade, pay as you grow
- Enhanced Serviceability
  Rapid fault recovery
- Link to Newavewatch™
  Instantaneous fault recognition

Safe-Swap Modular Power Protection
Power range: 8-200KW per rack

Specifications are subject to change without notice

Edition 31.03.2009

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10.1 CONCEPTPOWER DPA SYSTEM DESCRIPTION

In environments that demand zero downtime, continuous power protection availability is essential. In order to respond to today's dynamic IT and process-related environments that experience daily change through new server technologies, migration and centralization, resilient and easily adaptable power protection concepts are required.
CONCEPTPOWER DPA is the foundation for continuous power protection availability of network-critical infrastructures in enterprise data centers where business continuity has paramount importance and in process control environment where manufacturing continuity is essential.

NEWAVE CONCEPTPOWER DPA'S is a second generation high-power-density (HPD), leading-edge double-conversion power protection technology that has standardized on a modular component approach which helps speed deployment, improve adaptability and increase system availability while reducing total cost of ownership.

CONCEPTPOWER DPA'S is a unique on-demand architecture that integrates the power rack, power distribution unit, back-up battery rack and monitoring and management solutions to allow easy selection of optimized configurations.

CONCEPTPOWER DPA'S (Distributed Parallel Architecture) provides highest availability, unmatched flexibility and at the same time lowest cost of ownership in IT environments.

This Technical Specification provides detailed technical information on the mechanical, electrical and environmental performance of the CONCEPTPOWER DPA that can support to give answers to tender and end-user requirements. The CONCEPTPOWER DPA was designed to respond to the most stringent safety, EMC and other important UPS standards.

CONCEPTPOWER DPA is a rack-mountable modular design. It offers 6-types of Racks (Frames) and 7 types of DPA-Modules to accommodate a wide range of power requirements.

The three MD-Frames; Classic DPA-25, Triple DPA-75, Upgrade DPA-150 can accommodate the four (4) MD-DPA-Modules types DPA 10 or 15 or 20 or 25 of: 10kVA/8kW - 15kVA/12kW - 20kVA/16kW - 25kVA/20kW power, whereas

The three MX-Frames; Classic DPA-50, Triple DPA-150, Upgrade DPA-250 can accommodate the three (3) MX-DPA-Modules types DPA 30 or 40 or 50 of: 30kVA/24kW - 40kVA/32kW - 45kVA/40kW power.

Key Features of CONCEPTPOWER DPA :

- Highest Availability
  Modular, Decentralized Parallel Architecture (DPA)
  Near-zero down time
- High Power Density (up to 342kW / m^2),
  Small Footprint
  Space-saving of expensive floor space
- Unity Output Power Factor (*KW=KVA)*
  Full power for loads with unity PF
  No de-rating for loads with Unity PF
- Blade-server-friendly power
  Full power from 0.9 lead to 0.8 lag
  No de-rating with leading PF loads
- Highest Efficiency even with partial loads
  Efficiency = 91 - 95.5% for loads 25-100%
  (depending on Module power and type of load)
  Energy cost saving during UPS-life-cycle
- Very low input current distortion THDi
  THDi = < 2 - 3% for loads of 100 – 25 %
  Gen-set power and installation cost saving

10.2 TECHNICAL CHARACTERISTICS

10.2.1 MECHANICAL CHARACTERISTICS MD-FRAMES AND MODULES

CONCEPTPOWER DPA		CLASSIC DPA-25	TRIPLE DPA-75	UPGRADE DPA-125
MD - FRAMES				
Configuration accommodates:	Max.	1 module (10-25kVA) and 200 x 7/9Ah batteries	3 modules (10-25kVA) and 180 x 7/9Ah batteries	5 modules (10-25kVA) and no batteries
Max. Power connection	kVA	25	75	125
Dimensions (WxHxD)	mm	550x1650x780	550x1975x780	550x1975x780
Weight of Empty Frame w/o modules and w/o batteries	kg	180	218	171
Weight of Frame with modules and w/o batteries	kg	209 up to 215 (with 1 Module)	304 up to 323 (with 3 Modules)	314 up to 346 (with 5 Modules)
Colours		Front door silver :RAL 9007 + NEWAVE black (inlets) Side walls/top: Graphite grey (Pulverlacke No. 4222903402 serie 09RCCAT1)		

MD- DPA MODULES		DPA 10	DPA 15	DPA 20	DPA 25
Output Apparent Rated Power	KVA	10	15	20	25
Output Active Rated Power	KW	8	12	16	20
Output Power with Load PF=1	KVA / KW	8 / 8	12 / 12	16 /16	20 /20
Variable Number of 12V Battery Blocks	No.	30 – 50	30 – 50	30 – 50	40 - 50
Dimensions (WxHxD)	mm	483 x 225 x 700			
Weight UPS Module	kg	28.5	31	33	35
Colours		Front : Graphite grey (Pulverlacke No. 4222903402 serie 09RCCAT1)			

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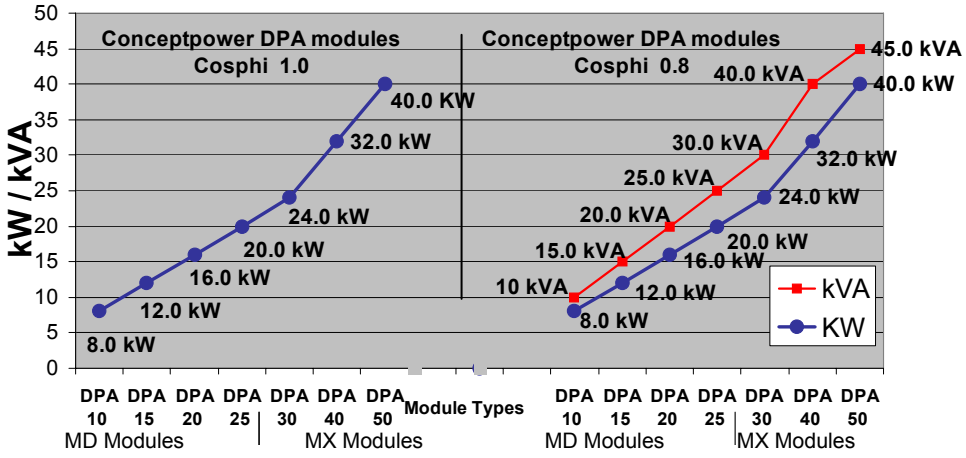
10.2.2 MECHANICAL CHARACTERISTICS MX-FRAMES AND MODULES

CONCEPTPOWER DPA		CLASSIC DPA-50	TRIPLE DPA-150	UPGRADE DPA-250
MX - FRAMES				
Configuration accommodates:	Max.	1 module (30-45kVA) and 280 x 7/9Ah batteries	3 modules (30-45kVA) and 240x 7/9Ah batteries	5 modules (30-45kVA) and no batteries
Max. Power connection	kVA	50	150	250
Dimensions (WxHxD)	mm	730x1650x800	730x1975x800	730x1975x800
Weight of Empty Frame w/o modules and w/o batteries	kg	262	239	205
Weight of Frame with modules and w/o batteries	kg	306 up to 318 (with 1 Module)	371 up to 407 (with 3 Modules)	425 up to 485 (with 5 Modules)
Colours		Front door silver :RAL 9007 + NEWAVE black (inlets) Side walls/top: Graphite grey (Pulverlacke No. 4222903402 serie 09RCCAT1)		

MX- DPA MODULES		DPA 30	DPA 40	DPA 50
Output Apparent Rated Power	KVA	30	40	45 [1)]
Output Active Rated Power	KW	24	32	40
Output Power with Load PF=1	KVA / KW	24 / 24	32 / 32	40 /40
Variable Number of 12V Battery Blocks	No.	40-50	40-50	40-50
Dimensions (WxHxD)	mm	663 x 225 x 720		
Weight UPS Module	kg	44	53	56
Colours		Front : Graphite grey (Pulverlacke No. 4222903402 serie 09RCCAT1)		
1) On Inverter mode 50 KVA/40kW on Bypass mode 45 KVA/40kW				

10.2.3 POWER SELECTION TABLE CONCEPTPOWER DPA MODULES

Conceptpower DPA: Power Modules DPA 10 - DPA 50

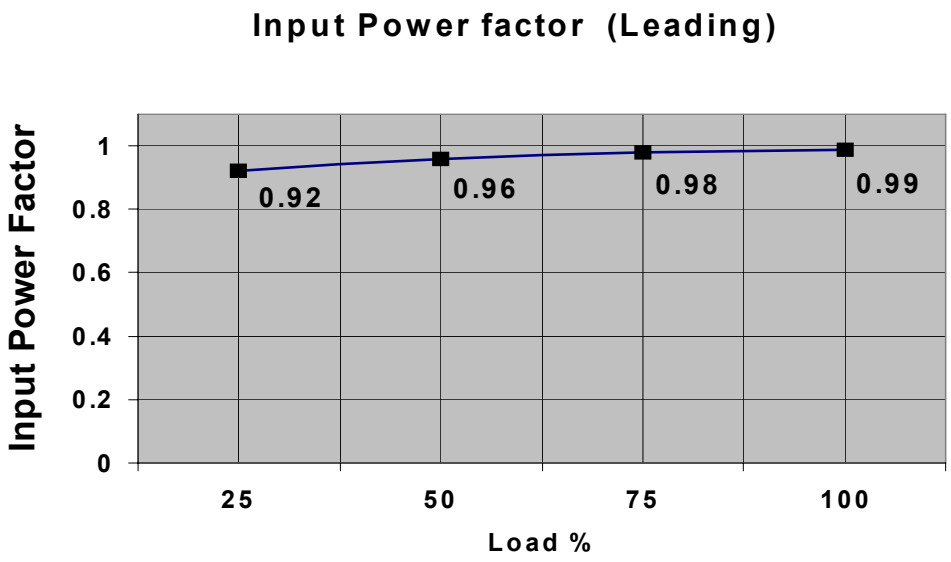


10.3 INPUT CHARACTERISTICS

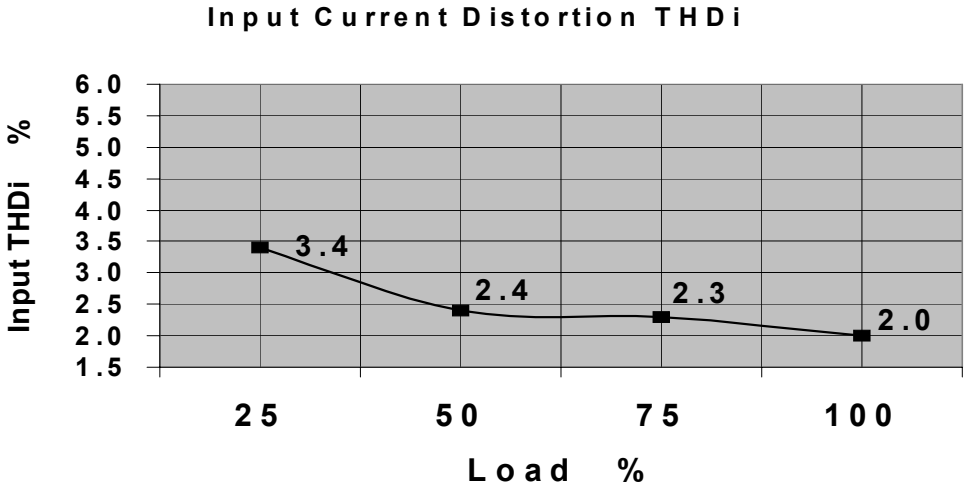
Module Range		MD				MX		
Module Type		DPA 10	DPA 15	DPA 20	DPA 25	DPA 30	DPA 40	DPA 50
Output Rated Power per Module cosφ 0.8	kVA	10	15	20	25	30	40	45 [1)]
Output Rated Power per Module cosφ 1.0	KW	8	12	16	20	24	32	40
Nominal Input Voltage	V	3x380/220V+N, 3x400V/230V+N, 3x415/240V+N						
Input Voltage Tolerance (ref to 3x400/230V) for Loads in %:	V	(-23%/+15%) 3x308/177 V to 3x460/264 V for <100 % load (-30%/+15%) 3x280/161 V to 3x460/264 V for < 80 % load (-40%/+15%) 3x240/138 V to 3x460/264 V for < 60 % load						
Input Frequency	Hz	35 – 70						
Input Power Factor		PF=0.99 @ 100 % load						
Inrush Current	A	limited by soft start / max. In						
Input Distortion THDI		Sine-wave THDi = < 2 % @ 100% load						
Max. Input Power with rated output power and charged battery per Module (output Cosφ = 1.0)	kW	8.5	12.8	17.0	21.3	25.4	33.9	42.9
Max. Input Current with rated output power and charged battery per Module (output Cosφ = 1.0)	A	12.3	18.5	24.7	30.8	36.8	49.1	62.1
Max. Input Power with rated output power and discharged battery per Module (output Cosφ = 1.0)	kW	9.3	14.0	18.6	23.3	27.8	37.1	46.9
Max. Input Current with rated output power and discharged battery per Module (output Cosφ = 1.0)	A	13.5	20.2	27.0	33.7	40.3	53.7	68.0

1) On Inverter mode 50 KVA/40kW on Bypass mode 45 KVA/40kW

10.3.1 GRAPH: INPUT PF VERSUS % LOAD



10.3.2 GRAPH: INPUT DISTORTION THDI VERSUS % LOAD



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10.4 BATTERY CHARACTERISTICS

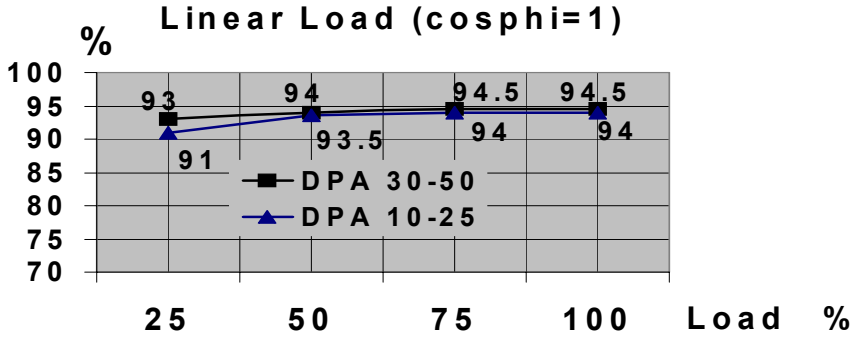
Module Range		MD				MX		
Module Type		DPA 10	DPA 15	DPA 20	DPA 25	DPA 30	DPA 40	DPA 50
Variable Number of 12V Battery Blocks	No.	30-50	30-50	30-50	40-50	40-50	40-50	40-50
Maximum Battery Charger Current	A	6A Standard (10 A optional)				10A Standard (15 A optional)		
Battery Charging Curve		Ripple free ; IU (DIN 41773)						
Temperature compensation		Standard (temp. sensor optional)						
Battery Test		Automatic and periodically (adjustable)						
Battery Type		Maintenance free VRLA or NiCd						

10.5 OUTPUT CHARACTERISTICS

Module Range		MD				MX		
Module Type		DPA 10	DPA 15	DPA 20	DPA 25	DPA 30	DPA 40	DPA 50
Output Rated Power per Module	kVA	10	15	20	25	30	40	45 [1)]
Output Rated Power per Module	KW	8	12	16	20	24	32	40
Output Current In @ cosphi 1.0 (400 V)	A	11.6	17.4	23.2	29	35	46.5	58
Output Rated Voltage	V	3x380/220V or 3x400/230V or 3x415/240V						
Output Voltage Stability	%	Static: < +/- 1% Dynamic (Step load 0%-100% or 100%-0%) < +/- 4%						
Output Voltage Distortion	%	With Linear Load < 1.5% With Non-linear Load (EN62040-3:2001) < 2%						
Output Frequency	Hz	50 Hz or 60 Hz						
Output Frequency Tolerance	%	Synchronized with mains < +/- 2 % (selectable for bypass operation) or < +/- 4 % Free running +/- 0.1 %						
Bypass operation		At Nominal Input voltage of 3x400 V +/- 15% or 190 V to 264 V ph-N						
Permissible Unbalanced Load (All 3 phases regulated independently)	%	100%						
Phase Angle Tolerance (With 100 % Unbalanced load)	Deg.	+/- 0 deg.						
Overload Capability on Inverter	%	125 % load 10 min. 150 % load 60 sec.						
Output short capability (RMS)	A	Inverter : 2 x In during 250 ms Bypass : 10 x In during 10 ms						
Crest - Factor		3 : 1						
1) On Inverter mode 50 KVA/40kW on Bypass mode 45 KVA/40kW								

10.5.1 GRAPH: AC – AC EFFICIENCY with Linier load @ cosphi 1

Efficiency up to 1 % higher with output PF cosphi 0.8
Details refer to paragraph 10.7 Environmental Characteristics



10.5.2 GRAPH: Output Power in KW and KVA VERSUS cosphi

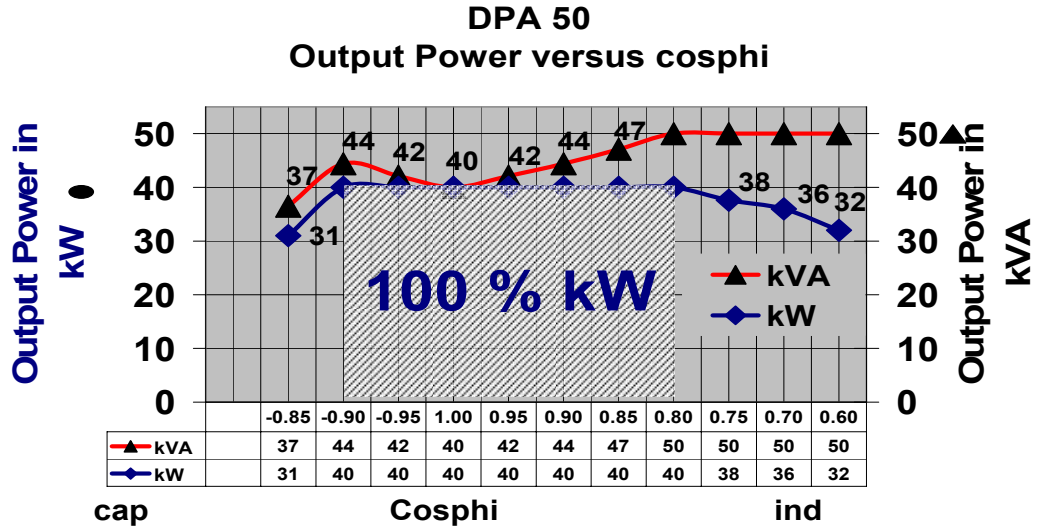


Fig. AC-AC Efficiency of DPA 50 Module

		MD Module Range								MX Module Range					
		DPA10		DPA15		DPA20		DPA25		DPA30		DPA40		DPA50 [1]	
	cosφ	kW	kVA	kW	kVA	kW	kVA	kW	kVA	kW	kVA	kW	kVA	kW	kVA
Cap.	0.85	6.2	7.3	9.3	11	12.3	14.5	15.4	18.1	18.5	21.8	24.6	29	31	36.5
	0.90	8	8.9	12	13.3	16	17.8	20	22.2	24	26.7	32	35.6	40	44.4
	0.95	8	8.4	12	12.6	16	16.8	20	21.1	24	25.3	32	33.7	40	42.1
	1.00	**8**	**8**	**12**	**12**	**16**	**16**	**20**	**20.0**	**24**	**24**	**32**	**32.0**	**40**	**40**
	0.95	8	8.4	12	12.6	16	16.8	20	21.1	24	25.3	32	33.7	40	42.1
	0.90	8	8.9	12	13.3	16	17.8	20	22.2	24	26.7	32	35.6	40	44.4
	0.85	8	9.4	12	14.1	16	18.8	20	23.5	24	28.2	32	37.6	40	47.1
Ind.	0.80	8	10	12	15	16	20	20	25	24	30	32	40	40	50[1]
	0.75	7.6	10	11.4	15	15.3	20	19.1	25	22.9	30	30.5	40	38	50[1]
	0.70	7.2	10	10.8	15	14.5	20	18.1	25	21.7	30	28.9	40	36	50[1]
	0.60	6.3	10	9.5	15	12.7	20	15.9	25	19	30	25.4	40	32	50[1]

1) DPA 50 : On Inverter Mode 50 KVA/40kW on Bypass Mode 45 KVA/40kW

Changes of this table without notice – modifications reserved

10.6 ENVIRONMENTAL CHARACTERISTICS

Module Range		MD				MX		
Module Type		DPA 10	DPA 15	DPA 20	DPA 25	DPA 30	DPA 40	DPA 50
Audible Noise with 100% / 50% Load	dBA	55/49	57/49	57/49	57/49	59/51	65/55	65/55
Operation temperature	°C	0 – 40						
Ambient Temperature for Batteries (recommended)	°C	20 – 25						
Storage Temperature	°C	-25 - +70						
Battery Storage Time at Ambient Temperature		Max. 6 months						
Max. altitude (above sea level)	m	1000m (3300ft) without de-rating						
De-rating factor for use at altitudes above 1000m sea level according (IEC 62040-3)		Meter above sea level (m / ft)	De-Rating Factor for Power					
		1500 / 4850	0.95					
		2000 / 6600	0.91					
		2500 / 8250	0.86					
		3000 / 9900	0.82					
Relative Air-humidity		Max. 95% (non-condensing)						
Accessibility		Totally front accessibility for service and maintenance (no need for side, top or rear access)						
Positioning		Min. 20 cm rear space (required for fan)						
Input and Output Power Cabling		From the bottom on the front						
Efficiency AC-AC up to (at cosphi 1.0) (depending on Module power)	%	*Load* : *100 %* *75 %* *50%* *25%* DPA 30-50 : 94.5% 94.5% 94% 93% DPA 10-25 : 94% 94% 93.5% 91%						
Efficiency with Linear Load at cosφ =0.8ind Efficiency Non-linear Load (EN 62040-1-1:2003)		Typically up to 1 % higher of above values Typically up to 1 % lower of above values						
Eco-Mode efficiency at 100% load	%	98 %						

10.7 STANDARDS

Safety	IEC/EN 62040-1-1, IEC/EN 60950-1						
Electromagnetic Compatibility	IEC/EN 61000-6-4 (product standard IEC/EN 62040-2 limit A (C2 UPS)) IEC/EN 61000-6-2 (product standard IEC/EN 62040-2 Criterion A (C2 UPS)) IEC/EN 61000-4-2, IEC/EN 61000-4-3, IEC/EN 61000-4-4, IEC/EN 61000-4-5, IEC/EN 61000-4-6						
EMC Classification	DPA-10	DPA-15	DPA-20	DPA-25	DPA-30	DPA-40	DPA-50
Emission Class	C1	C1	C1	C2	C2	C2	C2
Immunity Class	C1	C2	C2	C3	C3	C3	C3
Performance	IEC/EN 62040-3						
Product certification	CE						
Degree of protection	IP 20						

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10.8 COMMUNICATION

Power Management Display (PMD)	1 LCD display for each module
Serial ports RS232 on Sub-D9	2x system frame + 1x on each module (Smart Port) For monitoring and integration in network management
USB	1x For monitoring and software management
Customer Interfaces : Inputs DRY PORT X1	1 Remote Shut down [EMERGENCY OFF (Normally closed)] 1 GEN-ON (Normally open) 2 Programmable Customer's Inputs (Normally open) 1 Temp. Sensor for Battery Control
Customer Interfaces : Outputs DRY PORT X2 , X3, X4	10 voltage free contacts For remote signalling and automatic computer shutdown
Slot for SNMP	SNMP card (optional) For monitoring and integration in network management
Slot for Newavewatch TM	Newavewatch TM card (optional) for Premium Power Protection

10.8.1 POWER MANAGEMENT DISPLAY (PMD)

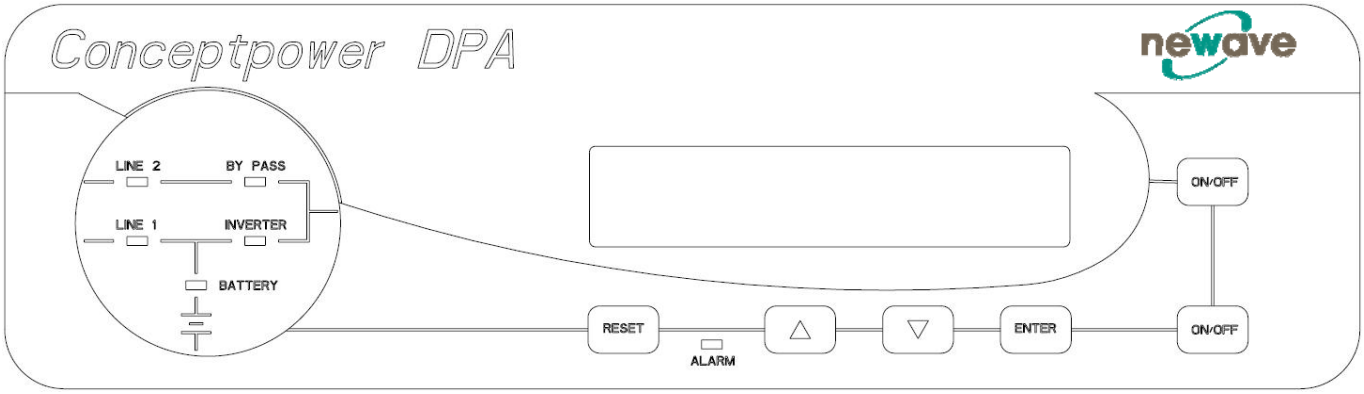
The user-friendly PMD consists of three parts the MIMIC DIAGRAM, CONTROL KEYS and LCD that provides the necessary monitoring information about the UPS.

10.8.2 MIMIC DIAGRAM

The mimic diagram serves to give the general status of the UPS. The LED-indicators show the power flow status and in the event of mains failure or load transfer from inverter to bypass and vice-versa the corresponding LED-indicators will change colour from green (normal) to red (warning). The LED's LINE 1 (rectifier) and LINE 2 (bypass) indicate the availability of the mains power supply. The LED's INVERTER and BYPASS if green indicate which of the two are supplying power to the critical load. When the LED-indicator BATTERY is lit it means that the battery due to mains failure is supplying the load. The LED-indicator ALARM is a visual indication of any internal or external alarm condition. At the same time the audible alarm will be activated.

10.8.3 DISPLAY

The 2 x 20 character LCD simplifies the communication with the UPS. The menu driven LCD enables the access to the EVENT REGISTER, or to monitor the input and output U, I, f, P, Autonomy Time and other Measurement's, to perform commands like start-up and shut-down of INVERTER or load transfer from INVERTER to BYPASS and vice-versa and finally it serves for the DIAGNOSIS (SERVICE MODE) for adjustments and testing (for more details see the USER MANUAL of Conceptpower DPA[TM]).



Power Management Display (PMD) of Conceptpower DPM TM

10.8.4 CUSTOMER INTERFACES (Terminals X1….X4)

10.8.5 CUSTOMER INPUTS DRY PORT s: Terminal block X1

Connection of Remote Shut down facilities, Generator Operation, Customers specials
(see UM Section 9 / OPTIONS)

10.8.6 CUSTOMER OUTPUTS DRY PORTs : Terminal blocks X2, X3, X4

Provision of signals for the automatic and orderly shutdown of servers, AS400 or Automation building systems
All voltage free contacts are rated 60 VAC max. and 500 mA max.:
All the interfaces are connected to Phoenix Spring terminals with wires : 0.5 mm2

Block	Terminal	Contact	Signal	On Display	Function
X1	X1 / 1	IN	+ 3.3 Vdc		**Remote Shut down**
	X1 / 2	GND	GND		(Do not remove the factory mounted bridge until external Remote Shut down is connected)
	X1 / 3	IN	+ 3.3 Vdc		**Generator Operation**
	X1 / 4	GND	GND		(NC = Generator ON)
	X1 / 5	IN	+ 3.3 Vdc		**Customer IN 1**
	X1 / 6	GND	GND		(Function on request, to be defined)
	X1 / 7	IN	+ 3.3 Vdc		**Customer IN 2**
	X1 / 8	GND	GND		(Function on request, to be defined)
	X1 / 9	IN	+ 3.3 Vdc		**Temperature Battery**
	X1 / 10	GND	GND		(If connected , the battery charger current if depending of the battery temp.)
X2	X2 / 1	NO	ALARM	MAINS_OK	Mains Present
	X2 / 2	NC			**Mains Failure**
	X2 / 3	C			Common
	X2 / 4	NO	Message	LOAD_ON_INV	**Load on Inverter**
	X2 / 5	NC			(Load on Mains bypass)
	X2 / 6	C			Common
	X2 / 7	NO	ALARM	BATT_LOW	**Battery Low**
	X2 / 8	NC			Battery OK
	X2 / 9	C			Common
	X2 / 10	NO	Message	LOAD_ON_MAINS	**Load on bypass** (Mains)
X3	X3 / 1	NC			(Load on Inverter)
	X3 / 2	C			Common
	X3 / 3	NO	ALARM	COMMON_ALARM	**Common Alarm** (System)
	X3 / 4	NC			NO Alarm Condition
	X3 / 5	C			Common
	X3 / 6	NO	ALARM	MODUL_ALARM1	**Module 1 Alarm**
	X3 / 7	NC			NO Alarm Condition
	X3 / 8	C			Common
	X3 / 9	NO	ALARM	MODUL_ALARM2	**Module 2 Alarm**
	X3 / 10	NC			NO Alarm Condition
X4	X4 / 1	C			Common
	X4 / 2	NO	ALARM	MODUL_ALARM3	**Module 3 Alarm**
	X4 / 3	NC			NO Alarm Condition
	X4 / 4	C			Common
	X4 / 5	NO	ALARM	MODUL_ALARM4	**Module 4 Alarm**
	X4 / 6	NC			NO Alarm Condition
	X4 / 7	C			Common
	X4 / 8	NO	ALARM	MODUL_ALARM5	**Module 5 Alarm**
	X4 / 9	NC			NO Alarm Condition
	X4 / 10	C			Common

Phoenix Spring Terminals (X1…X4) Connection

10.9 OPTIONS

- Modem/Ethernet card or Modem/GSM card for Newavewatch™ Management Software
- SNMP card and WaveMon Management Software , Modbus Protocol
- External Battery Cabinets
- Parallel bus for additional frames
- In/Output Transformator for special voltages
- Battery Chargers
- Temp. sensor for battery temp. control

10.9.1 MODEM/ETHERNET CARD / Newavewatch™ MANAGEMENT SOFTWARE

Newavewatch™ is a redundant remote monitoring and management service which is a part of the Premium Power Protection Concept, providing you with peace-of-mind protection, knowing the mission critical facility is under careful, continuous watch 24/7/365. There are two different solution cards Modem/Ethernet or Modem/GSM to connect the UPS to the outside world.

Continuous monitoring is an affordable insurance policy to detect and warn before they become a crisis.
Acquire key performance parameter and productivity information in real-time to empower you with the details needed to better understand machine performance and faster troubleshoot downtime events.
Early warning system, so problems can be addressed before they become a real threat to the load.
Professional experts, your virtual service technician onside.
Total transparency of information and actions performed like Notification of all critical status changes, Coordination of equipment service, Reporting of all alarms with priorities.

What are the features?

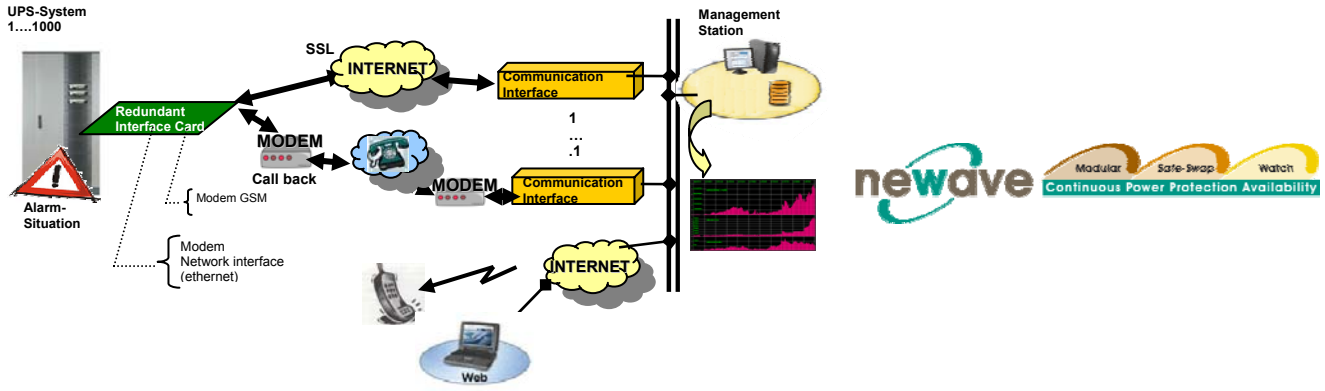
- Redundant and secure communication
- Alarm acknowledgment
- Priority driven Management (with escalation)

Comprehensive Management System

- Reception and management of alarm calls from UPS
- Storage of UPS Data in a database exportable in a CVS-format for easy handling in Excel
- Unlimited number of UPS that can be managed
- User administration with passwords and permission-level
- Administration of Log file
- Data logging with statistical analysis and diagnostics, report

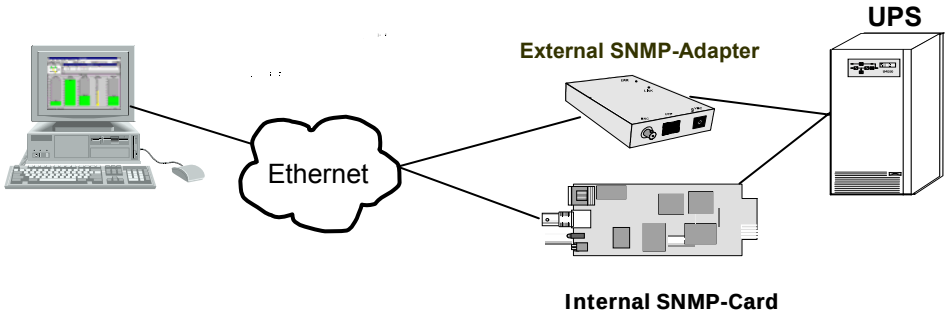
Visualization of the UPS data:

- Current status (“single” and “parallel” operation)
- Measured values for single or three phase
- Recording function including graphs with zooming capabilities for selected measured values
- Display of event log file
- Display of UPS Parameters
- Web Server functionality, for data access from any Web Browser

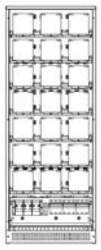
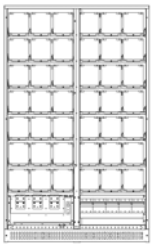


10.9.2 SNMP card / WaveMon Management Software

The Simple Network Management Protocol (SNMP) is a worldwide-standardized communication-protocol. It is used to monitor any device in the network via simple control language. The UPS-Management Software WaveMon also provides its data in this SNMP format with its internal software agent. The operating system you are using must support the SNMP protocol. We offer our WaveMon software with SNMP functionality for Novell, OS/2, all Windows running on INTEL and ALPHA, DEC VMS, Apple. Two types of SNMP interfaces with identical functionality are available: an external SNMP-Adapter (Box) and an internal SNMP-Card. Both can manage a parallel system (N modules) and return either global values - which are consistent for the whole parallel system - or specific values from the single modules.



10.9.3 BATTERY CABINETS

S-type = For Separate. Battery C-type = For Common. Battery		**CBAT-DPA-120** S-type or C-type	**CBAT-DPA-200** S-type or C-type
BATTERY FRAMES			
Configuration accommodates:	Max.	120 Batt. block x 24Ah/28Ah on 8 shelf 3x5=15 blocks/shelf	200 Batt. blocks x 24Ah/28Ah on 7 shelf 6x5=30 blocks/shelf
Battery fuses / Max. Batt. Strings : Terminals :	S-type	3 / 3 (Terminal 9 x 16/25mm2)	5 / 5 (Terminal 15 x 16/25mm2)
Battery fuses / Max. Batt. Strings Terminals :	C-type	3 / 3 + Com. Connection Bar 3 x (2xM8) +PE 2xM8	5 / 5 + Com. Connection Bar 3 x (2xM10) +PE 2xM10
Fuse Type (Very Fast acting)	A	3x100 A	5x100A
Dimensions (WxHxD)	mm	730x1975x800	1200x1975x800
Weight with trays and w/o batteries	kg	290	410
Possible Battery configurations within the Battery Cabinets		Battery Configurations 30x28Ah 40x28Ah 50x28Ah (2x30)x28Ah (2x40)x28Ah (2x50)x28Ah (3x30)x28Ah (3x40)x28Ah	Battery Configurations (2x40)x28Ah (3x40)x28Ah (4x40)x28Ah (5x40)x28Ah (2x50)x28Ah (3x50)x28Ah (4x50)x28Ah (5x30)x28Ah (5x40)x28Ah

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10.10 BATTERY AUTONOMIES

10.10.1 MD Modules: Examples of Internal Battery Autonomy

Module Type		*DPA 10*	*DPA 15*	*DPA 20*	*DPA 25*
Separate Battery configuration		**Battery Autonomy in (min.) per Module**			
Frame Type	**Battery / Module** (up to 3 modules / within Triple-75 frame)	**10kVA/8KW**	**15kVA/12KW**	**20KVA/16KW**	**25KVA/20KW**
CLASSIC DPA-25 or TRIPLE DPA-75	40x7Ah / 9Ah	8 / 14	5 / 8		
CLASSIC DPA-25 or TRIPLE DPA-75	50x7Ah / 9Ah	11 / 18	7 / 11		
CLASSIC DPA-25 or TRIPLE DPA-75	(2x30)x7Ah / 9Ah	14 / 23	8 / 14	6 / 9	
Common Battery configuration		**Battery Autonomy in (min.) for Tot. System Power**			
With 1 Module	***Module Type***	***1 x DPA 10***	***1 x DPA 15***	***1 x DPA 20***	***1 x DPA 25***
	Total System Power	**10kVA/8KW**	**15kVA/12KW**	**20KVA/16KW**	**25KVA/20KW**
CLASSIC DPA-25 or TRIPLE DPA-75	(2x40)x7Ah / 9Ah	21 / 33	12 / 20	8 / 14	6 / 10
CLASSIC DPA-25 or TRIPLE DPA-75	(2x50)x7Ah / 9Ah	28 / 43	16 / 26	11 / 18	8 / 14
CLASSIC DPA-25 or TRIPLE DPA-75	(3x40)x7Ah / 9Ah	35 / 54	21 / 33	14 / 23	11 / 23
CLASSIC DPA-25 or TRIPLE DPA-75	(3x50)x7Ah / 9Ah	47 / 1h 12`	28 / 43	19 / 30	14 / 23
ONLY for CLASSIC DPA-25	(4x50)x7Ah / 9Ah	1h 09' / 1h 44`	41 / 1h 02`	28 / 43	21 / 33
With 2 Modules	***Module Type***	***2 x DPA 10***	***2 x DPA 15***	***2 x DPA 20***	***2 x DPA 25***
	Total System Power	**20kVA/16KW**	**30kVA/24KW**	**40kVA/32KW**	**50kVA/40KW**
TRIPLE DPA-75	(2x40)x7Ah / 9Ah	8 / 14	5 / 8		
TRIPLE DPA-75	(2x50)x7Ah / 9Ah	11 / 18	7 / 11		
TRIPLE DPA-75	(3x40)x7Ah / 9Ah	14 / 23	8 / 14	6 / 9	
TRIPLE DPA-75	(3x50)x9Ah	30	18	13	9
With 3 Modules	***Module Type***	***3 x DPA 10***	***3 x DPA 15***	***3 x DPA 20***	***3 x DPA 25***
	Total System Power	**30kVA/24KW**	**45kVA/36KW**	**60kVA/48KW**	**75kVA/60KW**
TRIPLE DPA-75	(2x40)x7Ah / 9Ah	5 / 8			
TRIPLE DPA-75	(2x50)x7Ah / 9Ah	7 / 11			
TRIPLE DPA-75	(3x40)x7Ah / 9Ah	8 / 14	5 / 8		
TRIPLE DPA-75	(3x50)x9Ah	18	11	8	6

10.10.2 MD Modules: Examples of External Battery Autonomy

This configuration are mostly used in combination with the frame UPGRADE DPA-125

Module Type		*DPA 10*	*DPA 15*	*DPA 20*	*DPA 25*
Separate Battery configuration		**Battery Autonomy in (min.) per Module**			
Battery Cabinet (for up to 5 modules linked)	**Battery / Module**	**10kVA/8KW**	**15kVA/12KW**	**20KVA/16KW**	**25KVA/20KW**
1x CBAT-DPA-200	30x28Ah	37	22	15	
1x CBAT-DPA-200	40x28Ah	54	32	22	17
Common Battery configuration		**Battery Autonomy in (min.) for Tot. System Power (4+1)**			
With 4 Modules	***Module Type***	***4 x DPA 10***	***4 x DPA 15***	***4 x DPA 20***	***4 x DPA 25***
	Total System Power	**40kVA/32KW**	**60kVA/48KW**	**80kVA/64KW**	**100kVA/80KW**
1x CBAT-DPA-120	50x28Ah	12			
1x CBAT-DPA-120	(2x50)x28Ah	30	18	12	9
1x CBAT-DPA-120	(3x40)x28Ah	37	22	15	12
1x CBAT-DPA-200	(3x50)x28Ah	50	30	21	15
1x CBAT-DPA-200	(4x50)x28Ah	72	43	30	22

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10.10.3 MX Modules: Examples of Internal Battery Autonomy

Module Type		*DPA 30*	*DPA 40*	*DPA 50*
Separate Battery configuration		**Battery Autonomy in (min.) per Module**		
Frame Type	**Battery / Module** (up to 3 modules / within Triple-150 frame)	**30kVA/24KW**	**40KVA/32KW**	**45KVA/40KW**
CLASSIC DPA-50 or TRIPLE DPA-150	(2x40)x9Ah	8	6	
Common Battery configuration		**Battery Autonomy in (min.) for Tot. System Power**		
With 1 Module	***Module Type***	***1 x DPA 30***	***1 x DPA 40***	***1 x DPA 50***
	Total System Power	**30kVA/24KW**	**40KVA/32KW**	**45KVA/40KW**
CLASSIC DPA-50	(2x50)x9Ah	11	8	
CLASSIC DPA-50	(3x40)x9Ah	14	9	
CLASSIC DPA-50	(3x50)x9Ah	18	13	9
CLASSIC DPA-50	(4x50)x9Ah	26	18	14
CLASSIC DPA-50	(5x50)x9Ah	34	24	18
With 2 Modules	***Module Type***	***2 x DPA 30***	***2 x DPA 40***	***2 x DPA 50***
	Total System Power	**60kVA/48KW**	**80kVA/64KW**	**90kVA/80KW**
TRIPLE DPA-150	2x(2x40)x9Ah	8		
TRIPLE DPA-150	3x(2x40)x9Ah	14	9	7
With 3 Modules	***Module Type***	***3 x DPA 30***	***3 x DPA 40***	***3 x DPA 50***
	Total System Power	**90kVA/72KW**	**120kVA/96KW**	**135kVA/120KW**
TRIPLE DPA-150	3x(2x40)x9Ah	8	6	

10.10.4 MX Modules : Examples of External Battery Autonomy

This configuration are mostly used in combination with the frame UPGRADE DPA-250

Module Type		*DPA 30*	*DPA 40*	*DPA 50*
Separate Battery configuration		**Battery Autonomy in (min.) per Module**		
Battery Cabinet (for up to 5 modules linked)	**Battery / Module**	**30kVA/24KW**	**40KVA/32KW**	**45KVA/40KW**
1x CBAT-DPA-200	40x28Ah	13	9	7
Common Battery configuration		**Battery Autonomy in (min.) for Tot. System Power (4+1)**		
With 4 Modules	***Module Type***	***4 x DPA 30***	***4 x DPA 40***	***4 x DPA 50***
	Total System Power	**120kVA/96KW**	**160kVA/128KW**	**180kVA/160KW**
1x CBAT-DPA-120	(3x40)x28Ah	9	6	
1x CBAT-DPA-200	(3x50)x28Ah	12	9	
1x CBAT-DPA-200	(4X50)x28Ah	18	12	9
2x CBAT-DPA-200	5x (2x40) x 28Ah	43	30	22

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10.11 INSTALLATION PLANNING

Clearances	X	Y
Minimum	200mm	900 mm

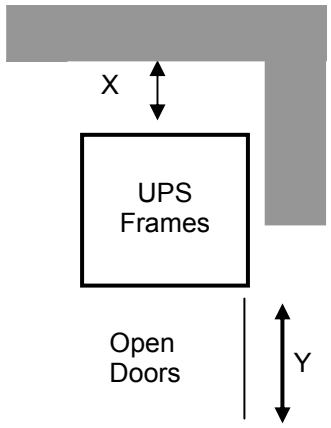

Figure 1: UPS space recommendation

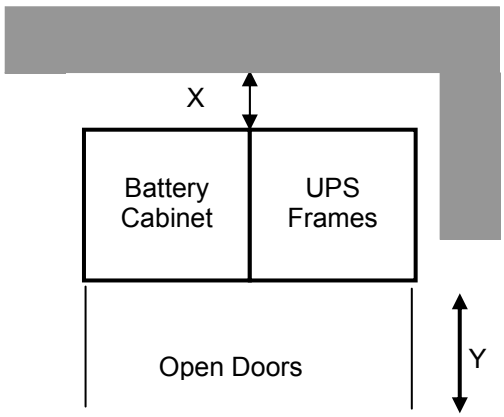

Figure 2 : : UPS + Battery space recommendation

UPS Frame type (25kVA up to 125 kVA)	**CLASSIC DPA-25**	**TRIPLE DPA-75**	**UPGRADE DPA-125**
Dimensions (WxHxD) mm	550x1650x780	550x1975x780	550x1975x780
UPS Frame type (50kVA up to 250 kVA)	**CLASSIC DPA-50**	**TRIPLE DPA-150**	**UPGRADE DPA-250**
Dimensions (WxHxD) mm	730x1650x800	730x1975x780	730x1975x800
Battery Cabinet Type	NA	**CBAT DPA-120**	**CBAT DPA-200**
Dimensions (WxHxD) mm	NA	730x1975x800	1200x1975x800
Accessibility	Totally front accessibility for service and maintenance (no need for side, top or rear access)		
Positioning	Min. 20 cm rear space (required for fan)		
Input and Output Power Cabling	From the bottom on the front		

10.11.1 HEAT DISSIPATION PER MODULE WITH NON-LINEAR LOAD

Module size		MD				MX		
Module Type		DPA 10	DPA 15	DPA 20	DPA 25	DPA 30	DPA 40	DPA 50
Heat Dissipation with 100% Non-linear Load per Module (EN 62040-1-1:2003)	W	600	900	1200	1500	1670	2225	2780
Heat Dissipation with 100% Non-linear Load per Module (EN 62040-1-1:2003)	BTU	2047	3070	4094	5118	5698	7592	9485
Airflow (25° - 30°C) with Non-linear Load per Module (EN 62040-1-1:2003)	m^3/h	150	150	150	150	380	380	380

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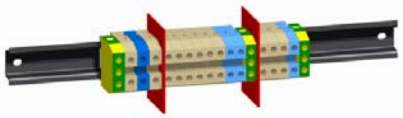
10.12 WIRING AND BLOCK DIAGRAMS FOR ALL FRAMES AND MODULES

The customer has to supply the wiring to connect the UPS to the local power source. The installation inspection and initial start up of the UPS and extra battery cabinet must be carried out by a qualified service personnel such as a licensed service engineer from the manufacturer or from an agent authorised by the manufacturer. More details and procedure are mentioned in the user manual.

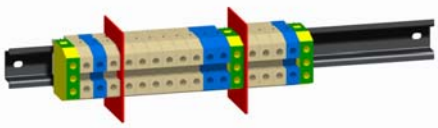
10.12.1 TERMINAL CONNECTIONS OVERVIEW

FRAME TYPE Terminals (T) Connection Bar (B)	**Separate. Battery** (+ / N / -) +PE	**Common Battery** (+ / N / -) +PE	**Input Bypass** 3+N	**Input Rectifier** 3+N+PE	**Output load** 3+N+PE
CLASSIC DPA-25	3+1 x 16/25mm^2 (T)	3+1 x 16/25mm^2 (T)	4 x 10/16mm^2 (T)	5 x 10/16mm^2 (T)	5 x 10/16mm^2 (T)
TRIPLE DPA-75	9+1 x 16/25mm^2 (T)	3 x M6 (B) +PE 1 x 16mm^2 (T)	4 x 35/50mm^2 (T)	4 x 35/50mm^2 (T) +PE 50 mm^2 (T)	4 x 35/50mm^2 (T) +PE 50 mm^2 (T)
UPGRADE DPA-125	15+1 x 16/25mm^2 (T)	3 x M10 (B) +PE 1 x 50mm^2 (T)	4 x 70/95mm^2 (T)	4 x 70/95mm^2 (T) + PE 50mm^2 (T)	4 x 70/95mm^2 (T) + PE 50mm^2 (T)
CLASSIC DPA-50	3+1 x 16/25mm^2 (T)	3+1 x 16/25mm^2 (T)	4 x 16/25mm^2 (T)	5 x 16/25mm^2 (T)	5 x 16/25mm^2 (T)
TRIPLE DPA-150	9+1 x 16/25mm^2 (T) +PE 1xM10 (B)	3 x M10 (B) +PE 1xM10 (B)	3 x M10(B) +PE 1xM10 (B)	4 x M10 (B) +PE 1xM10 (B)	4 x M10 (B) +PE 1xM10 (B)
UPGRADE DPA-250	15 x 16/25mm^2 (T) +PE 1xM12 (B)	3 x M12 (B) +PE 1xM12 (B)	3 x M12 (B) +PE 1xM12 (B)	4 x M12 (B) +PE 1xM12 (B)	4 x M12 (B) +PE 1xM12 (B)

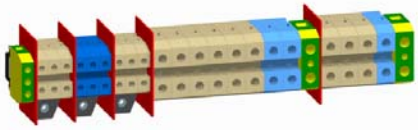
CLASSIC DPA-25



CLASSIC DPA-50

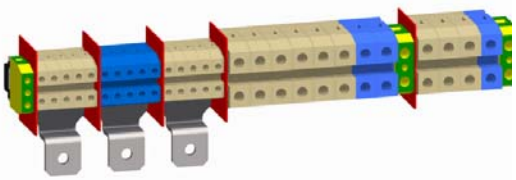


TRIPLE DPA-75

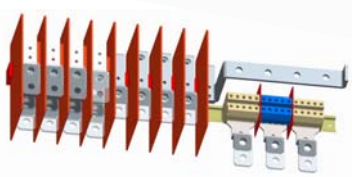


TRIPLE DPA-150

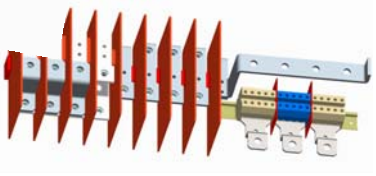
Upgrade DPA-125



UPGRADE DPA-250



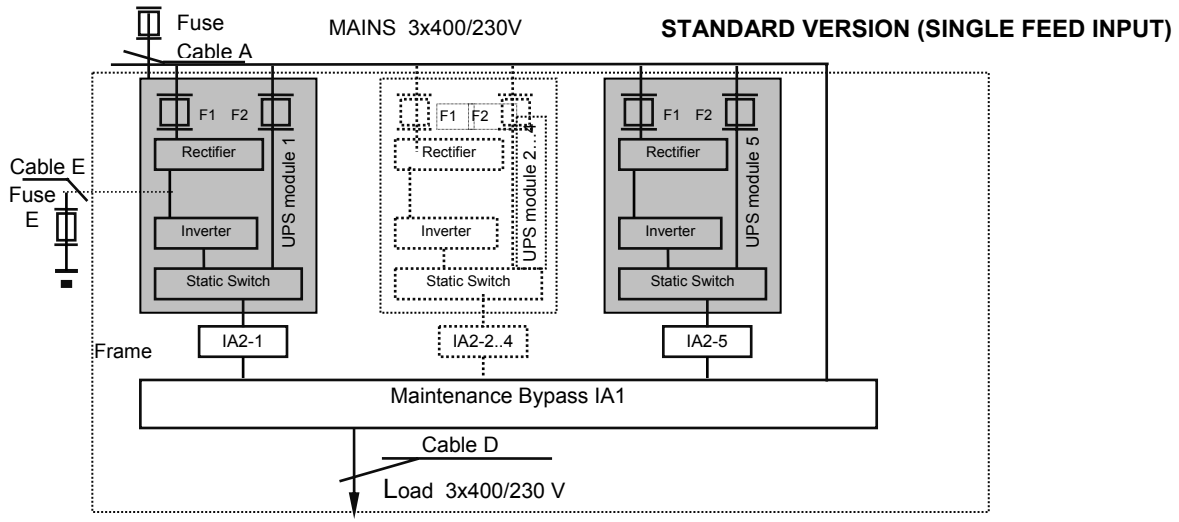
Dual feed input



Single feed input

10.12.2 SINGLE FEED INPUT

Cable Sections and Fuse Ratings recommended. Alternatively, local standards to be respected



Frame type	Load kVA cosphi 0.8	Input 3x400V			Output 3x400V cosphi 0.8			Battery	
		Fuse A (Agl/CB)	Cable A (mm^2) (IEC 60950-1:2001)	Max. Input Current with battery charging (A)	Cable D (mm^2) (IEC 60950-1:2001)	I nom (A)	Fuse E + / N / - (Agl/CB)	Cable E (mm^2) for CBAT DPA 120 or 200 ONLY + / N / -	
								Com. Battery	Sep. Battery
MD Frames (Frames shall be cabled to there full rating capability)									
CLASSIC DPA-25	25	3x63A	5x10	34	5x10	36 A	3x63A*1	3x10	3x10
TRIPLE DPA-75	75	3x125A	5x50	101	5x50	108 A	3x160A*1	3x50	3x (3x10)
UPGRADE DPA-125	125	3x225A	5x95	169	5x95	181 A	3x260A*1	3x120	5x (3x10)
MX Frames (Frames shall be cabled to there full rating capability)									
CLASSIC DPA 50	50	3x100A	5x25	67	5x25	72 A	3x100A*1	3x25	3x25
TRIPLE DPA-150	150	3x250A	5x120 or 5x(2x50)	202	5x120 or 5x(2x50)	218 A	3x300A*1	3x150	3x (3x25)
UPGRADE DPA-250	250	3x400A	5x(2x95)	337	5x(2x95)	362 A	3x500A*1	3x(2x150)	5x (3x25)
Other intermediate Ratings (we recommend to cable the frame mentioned above at full rating to able future upgrading)									
	10	3x20A	5x2.5	13	5x2.5	14 A	3x32A	3x4	
	15	3x25A	5x4	20	5x4	22 A	3x63A	3x10	
	20	3x40A	5x6	27	5x6	29 A	3x63A	3x10	
	30	3x63A	5x10	40	5x10	43 A	3x80A	3x16	
	40	3x80A	5x25	54	5x25	58 A	3x100A*	3x25*	
	45	3x100A	5x25	68	5x25	65 A	3x125A*	3x35*	
	60	3x100A	5x25	81	5x25	87 A	3x125A*	3x35*	
	80	3x125A	5x50	108	5x50	116 A	3x160A*	3x50*	
	90	3x160A	5x50	121	5x50	130 A	3x200A*	3x70*	
	100	3x160A	5x50	135	5x50	145 A	3x224A*	3x95*	
	120	3x200A	5x70	161	5x70	174 A	3x250A*	3x120*	
	160	3x250A	5x120 or 5x(2x50)	215	5x120 or 5x(2x50)	232 A	3x350A*	3x(2x70)*	
	200	3x315A	5x185 or 5x(2x70)	267	5x185 or 5x(2x70)	290 A	3x450A*	3x(2x95)*	

*1 only valid for common battery use

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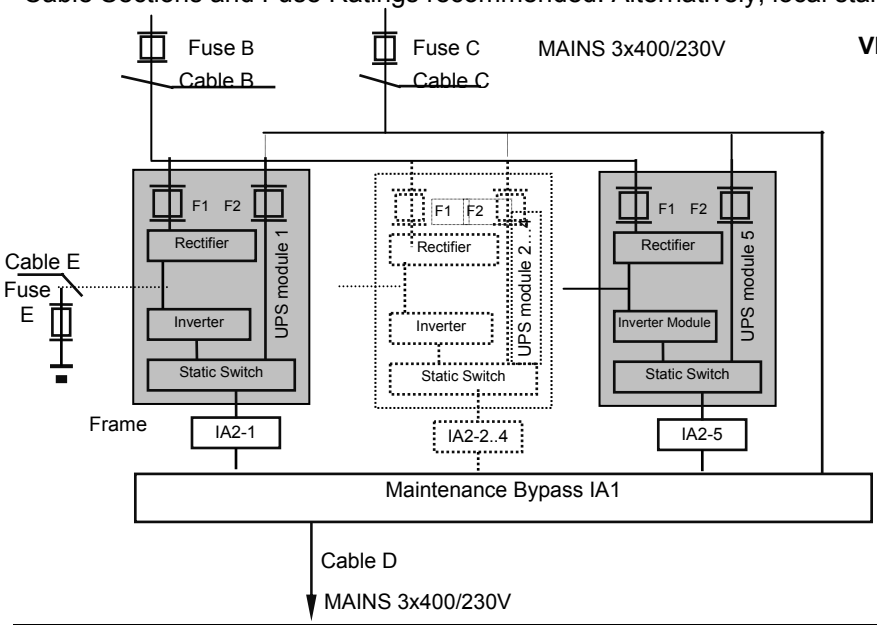
10.12.3 DUAL FEED INPUT

Cable Sections and Fuse Ratings recommended. Alternatively, local standards to be respected



Frame type	Load kVA cosphi 0.8	Input 3x400V			Bypass 3x400V		Output 3x400V cosphi 0.8		Battery		
		Fuse B (Agl/CB)	Cable B (mm^2) (IEC 60950-1:2001)	Max. Input Current with battery charging (A)	Fuse C (Agl/CB)	Cable C (mm^2) (IEC 60950-1:2001)	Cable D (mm^2) (IEC 60950-1:2001)	I nom	Fuse E +/N/- (Agl/CB)	Cable E (mm^2) for CBAT DPA 120 or 200 ONLY + / N / -	
										Com. Battery	Sep. Battery
MD Frames (Frames shall be cabled to there full rating capability)											
CLASSIC DPA-25	25	3x63A	5x10	34	3x63A	4x10	5x10	36 A	3x63A*1	3x10	3x10
TRIPLE DPA-75	75	3x125A	5x50	101	3x125A	4x50	5x50	108 A	3x160A*1	3x50	3x (3x10)
UPGRADE DPA-125	125	3x225A	5x95	169	3x225A	4x95	5x95	181 A	3x260A*1	3x120	5x (3x10)
MX Frames (Frames shall be cabled to there full rating capability)											
CLASSIC DPA 50	50	3x100A	5x25	67	3x100A	4x25	5x25	72 A	3x100A*1	3x25	3x25
TRIPLE DPA-150	150	3x250A	5x120 or 5x(2x50)	202	3x250A	4x120 or 4x(2x50)	5x120 or 5x(2x50)	218 A	3x300A*1	3x150	3x (3x25)
UPGRADE DPA-250	250	3x400A	5x(2x95)	337	3x400A	4x(2x95)	5x(2x95)	362 A	3x500A*1	3x(2x150)	5x (3x25)
Other intermediate Ratings (we recommend to cable the frame mentioned above at full rating to able future upgrading)											
	10	3x20A	5x2.5	13	3x20A	4x2.5	5x2.5	14 A	3x32A	3x4	
	15	3x25A	5x4	20	3x25A	4x4	5x4	22 A	3x63A	3x10	
	20	3x40A	5x6	27	3x40A	4x6	5x6	29 A	3x63A	3x10	
	30	3x63A	5x10	40	3x63A	4x10	5x10	43 A	3x80A	3x16	
	40	3x80A	5x25	54	3x80A	4x25	5x25	58 A	3x100A*	3x25*	
	45	3x100A	5x25	68	3x100A	4x25	5x25	65 A	3x125A*	3x35*	
	60	3x100A	5x25	81	3x100A	4x25	5x25	87 A	3x125A*	3x35*	
	80	3x125A	5x50	108	3x125A	4x50	5x50	116 A	3x160A*	3x50*	
	90	3x160A	5x50	121	3x160A	4x50	5x50	130 A	3x200A*	3x70*	
	100	3x160A	5x50	135	3x160A	4x50	5x50	145 A	3x224A*	3x95*	
	120	3x200A	5x70	161	3x200A	4x70	5x70	174 A	3x250A*	3x120*	
	160	3x250A	5x120 or 5x(2x50)	215	3x250A	4x120 or 4x(2x50)	5x120 or 5x(2x50)	232 A	3x350A*	3x(2x70)*	
	200	3x315A	5x185 or 5x(2x70)	267	3x315A	4x185 or 4x(2x70)	5x185 or 5x(2x70)	290 A	3x450A*	3x(2x95)*	

*1 only valid for common battery use

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